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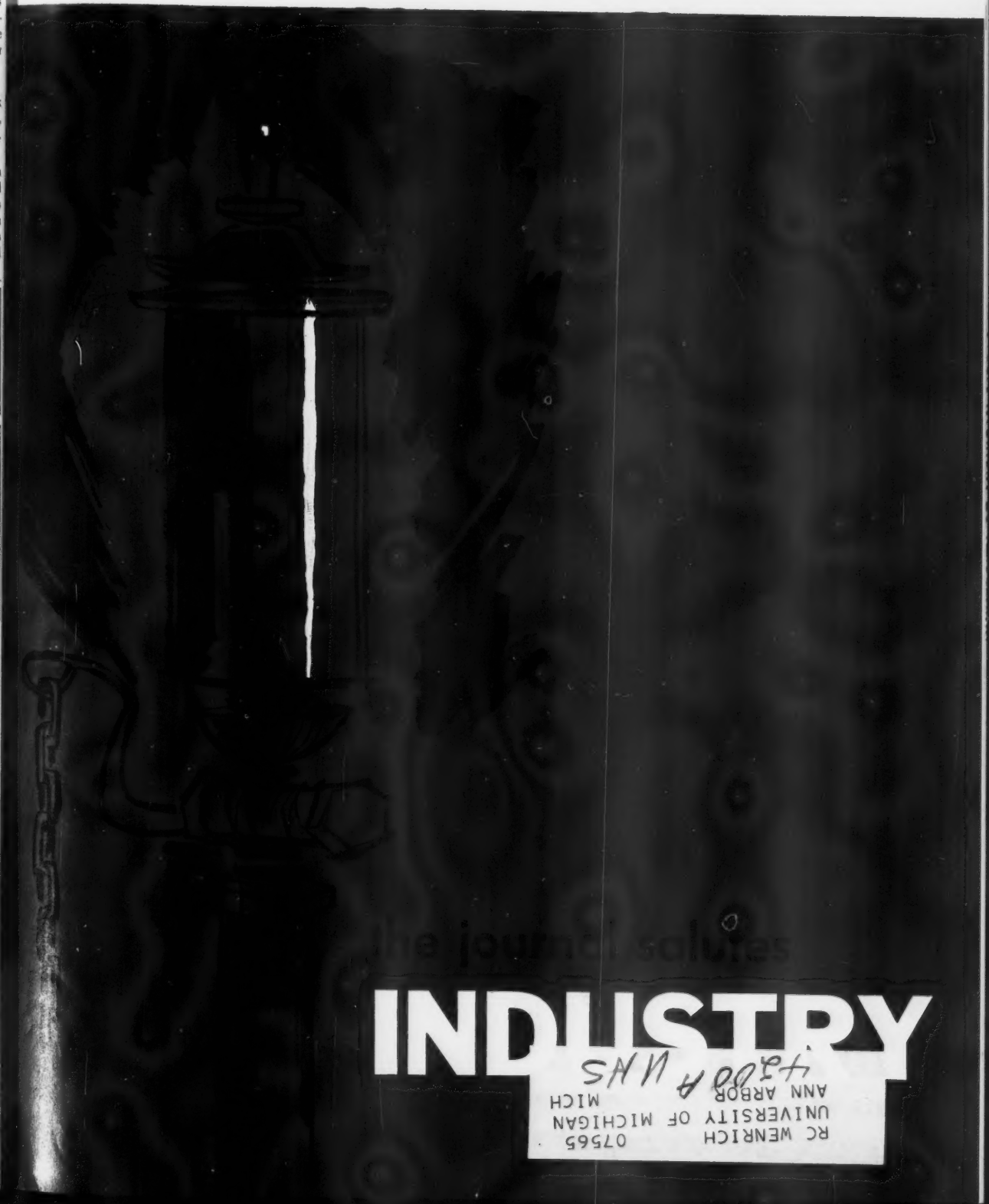
American VOCATIONAL Journal

APRIL 1960



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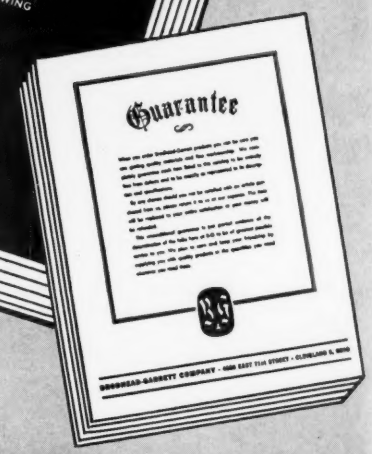

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WORK INJURIES RISE IN 1959

Job injuries experienced during 1959 disabled 1,970,000 American workers, according to preliminary estimates of the U. S. Department of Labor's Bureau of Labor Statistics. Approximately 13,800 of these injuries resulted in death.

The 1959 injury total, the highest since 1953, was 8 per cent above the 1958 figure. Though increased employment contributed to this rise, there was also an increase in the injury rate—up from 29.4 per thousand workers in 1958 to 31.2 in 1959. The 1959 rate was about the same as in 1954 and 1956 but was below other earlier years and 32 per cent below the wartime peak rate of 45.7 in 1943.

Fatal injuries did not increase as much as did work injuries in general. The 1959 total of 13,800 deaths was 4 per cent above the 1958 figure but was lower than any other year on record. The death rate of 22 per 100,000 workers matched the record low established in 1958.

Although the 1959 injury record was not so good as 1958, it compared favorably with that for most recent years. The upswing appears to reflect increased industrial activity, since the injury rate often rises when there is an influx of new workers and experienced workers are shifted to new processes and activities.

In addition to the 13,800 deaths, approximately 84,200 injuries resulted in some degree of permanent physical impairment, ranging from the amputation or partial loss of use of a finger or toe to complete inability to engage in any future gainful employment. The remaining 1,872,000 injuries each disabled a worker for 1 full day or more after the day of injury, but resulted in no permanent ill-effects.

Altogether, these injuries resulted in approximately 41 million man-days of disability during 1959. When the future effects of the deaths and permanent impairments are evaluated and added to the immediate loss, the total attributable to the 1959 injuries will amount to approximately 168 million man-days of disability—equivalent to a year's full-time employment of about 540,000 workers.

The principal increase in injuries occurred in manufacturing, from 340,000 in 1958 to 400,000 in 1959. Increased employment and hours of work, accompanied by a 10 per cent increase in the injury rate, contributed to this increase of 17 per cent in the volume of injuries.

In contract construction injuries increased 11 per cent, as a result of an increase in both employment and injury rates.

Only mining showed a decrease in injuries, due almost entirely to lower employment. Coal mining, according to reports to the Bureau of Mines, showed the lowest volume of injuries and deaths for any year on record.

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American VOCATIONAL Journal

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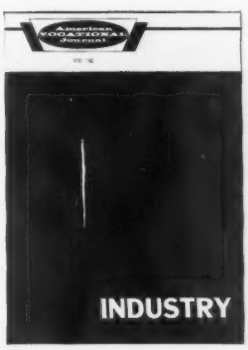

THE COVER: This month, the JOURNAL salutes industry with a sparkling array of special features of significance to AVA members in every field of service. There are big things going on these days in America's vocational schools and programs. Keep up-to-date and informed through the pages of your own professional magazine.

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IAPPC CABINET MEETS

THE CABINET of the AVA Industrial Arts Policy and Planning Committee met on March 16-17 at AVA headquarters in Washington, D. C. The meeting was called by Dr. John A. Jarvis, Dean of Industrial Education, Stout State College and AVA Vice-President for Industrial Arts, to plan the divisional program of work. G. Wesley Ketcham, Industrial Arts Consultant, Connecticut Department of Education and IAPPC Chairman, presided.

Others participating included: Lowell A. Burkett, AVA Assistant Executive Secretary; Gordon Funk, Supervisor of Industrial Arts, Los Angeles; Dr. John Fuzak, Professor of Industrial Arts, Michigan State University; Dr. G. Harold Silvius, Professor of Industrial Education at Wayne State University, and Industrial Arts Editor, AV JOURNAL; Dr. Robert M. Worthington, Professor of Industrial Arts, Trenton State College, and Secretary-Treasurer of the industrial arts education division of AVA.

The 1960 Industrial Arts Division Convention Program is being planned under the chairmanship of Gordon Funk. The Los Angeles program will include joint meetings with the trades and industry and the home economics divisions. *Leadership in Industrial Arts* will be the theme of one session; new devolpments in audio-visual materials and demonstrations of new teaching methods will feature another session; the implications of the *Great Cities Report* will be the theme of one-half day session.

A "think team" from industry will stimulate a panel discussion on industrial arts and technology in the next decade. A group visitation to a large industry will also be a feature.

The National Conference of State and Local Supervisors of Industrial Arts will be planned this year by Chairman David Taxis. This phase of the program will be held prior to the opening of the regular industrial arts division program.

Lowell Burkett reported an increase of 171 industrial arts members in the AVA over last year. The Cabinet endorsed the plan for promoting membership developed by Dr. M. Ray Karnes and the membership committee. This plan provides for regional representatives of IAPPC to work with the membership committee. These representatives will contact presidents and secretaries of AVA affiliates in their regions to determine problems of industrial arts membership and make recommendations to the committee.

The brochure describing the activities of the industrial arts education division will be brought up-to-date and reprinted as soon as possible.

The division, under the leadership of Dr. Jarvis, will conduct a study to ascertain the number of active industrial arts teachers in the United States. Dr. Jarvis will also prepare a newsletter which will be mailed directly to all industrial arts members of AVA. Significant activities of the division will, in this manner, be reported directly to all members.

Dr. G. Harold Silvius, Industrial Arts Editor for the *Journal*, reported that the September issue will be devoted entirely to industrial arts education and the 1960 Buyers' Guide. This featured issue is being planned with a 16 page insert reporting the symposium on industrial arts education held during the Chicago Convention. Also featured will be predictions for *Industrial Arts in the Soaring Sixties.* This special insert will be reprinted in quantity. Schools, professional groups, state departments and the like will want to order copies of this insert.

Latest Word from Washington

THE PRESIDENTIAL ELECTION. This month we have the privilege of presenting the results of the ballot-by-mail election of your 1961 AVA President—see page 8. You will note that 7,135 votes were cast. We regret that this is only about 20 per cent of those eligible to vote.

We know AVA members everywhere join us in wishing the President-elect, Dr. William B. Logan of Ohio, a most successful year in office. The pressure of current events brings annually enormous responsibility to the President of your American Vocational Association. We feel certain that Dr. Logan will be equal to the demands of his position, and we assure him now that he will have the unfailing support and confidence of the headquarters staff, the Executive Committee and AVA members throughout the nation.

THE SALUTE TO INDUSTRY. Last April, for the first time, the entire issue of the JOURNAL was devoted to a "salute to industry." This measure was so successful that we have decided to make this a traditional JOURNAL special.

We hope AVA members in every field of service will read with careful attention many—and preferably, all—of the provocative and informing features in this issue. We must never forget that regardless of our individual sphere of activity we cannot advance professionally unless we have our sights on the overall goals of vocational and practical arts education.

You will recall that in the February JOURNAL we offered a 14-page "Tribute to Agricultural Education." We are delighted to report that favorable comments on this material have since reached us from AVA members in fields of service other than agricultural education. One trade and industrial educator in Texas wrote to tell us how much he had enjoyed this material, and he added,

"We must all keep up-to-date with activities in every field of vocational education at the local, state and national levels. The AMERICAN VOCATIONAL JOURNAL is certainly the medium to which we must look for such guidance and information. . . . .

"It is only through broad knowledge and understanding of vocational education, general education and national affairs that we can continue to progress at a rate that is equal to the demands of the day."

Reprints of the "Tribute to Agricultural Education" are available from AVA headquarters at the following prices: 50 copies, $8.00; 100 copies, $15.00.

We are grateful to our Editor for Agricultural Education, Dr. George P. Deyoe, for his very astute judgment and assistance in developing this unique JOURNAL offering.

T AND I EDUCATION IN THE 60's. James R. D. Eddy has contributed for this issue of the JOURNAL an overview of what's ahead in trade and industrial education in the current decade. Mr. Eddy has done an outstanding job on this feature, and we are pleased to label it "recommended reading" for all AVA members.

We have already presented Ralph Bender's prognosis for agricultural education in the 60's—February JOURNAL. In subsequent issues similar forecasts, written by outstanding leaders, for each field of vocational and practical arts education, will be presented.

APPROPRIATIONS '61. As we go to press full and final action on the appropriation for vocational education for fiscal '61 has not been taken. The House has approved a total

appropriation of $49,608,393 for vocational education. This includes the full amount of $29,267,081 authorized in the George-Barden Act for agriculture, home economics, distributive education and trades and industry. In addition, $4 million was approved for practical nurse training and $180,000 for the fishery trades. The House also approved an additional $2 million for area vocational education programs, bringing this amount to $9 million.

The House refused to cut Title I funds in the amount of $2 million as recommended in President Eisenhower's Budget. In all likelihood, the Senate will confirm the action of the House on vocational education appropriations. If this is done, it will be the largest sum of federal funds ever appropriated for vocational education.

The House report on the appropriations measure contains the following significant statement:

"Promotion and further development of vocational education. — The bill includes $33,702,081, an increase of $2,000,000 above the amount requested, and the same as the amount appropriated for 1960. The Committee feels sure that its action in restoring the reduction in this most important and popular program was anticipated by everyone concerned."

VOCATIONAL EDUCATORS WILL VISIT RUSSIA. Within the next few weeks three American educators will visit the Soviet Union on a State Department sponsored tour to study Russia's program of vocational education. The AVA Executive Committee has selected for the visit Dr. H. H. London, immediate Past President of the AVA, and Mr. Mark Nichols of Utah, AVA President in 1954. They will be accompanied by Mr. Nicholas J. Rokitiansky with the International Education Division of the United States Office of Education, who speaks Russian and is familiar with the Russian system of education. He will serve as consultant and interpreter to Dr. London and Mr. Nichols. It is our hope that these American educators will be able to bring back to the American people facts regarding Russia's expanding program of vocational education. From speeches by Khrushchev during the past eighteen months, from articles in the magazine USSR and from reports of Americans who have visited Russia, the Soviets are now in the process of reorganizing their entire system of education. Their organization plan calls for greatly expanded vocational education programs. This development is a part of their announced plan to lick the United States in an economic war which Russia has already declared.

ATTENTION: VO-AG TEACHERS. A few weeks ago I received a letter from a vo-ag teacher in which he stated, "From various reports, I am hearing that the future for agricultural education appears to be rather discouraging." Then he asked this question, "Would you please advise me on the outlook for the field, as I feel it wise to check before making any change to something else?" In my reply to him I stated, "If you like your work as a teacher of vocational agriculture, I would strongly advise you to stick with it. The outlook for vocational education in agriculture in this country is very bright. I know a few people, lacking knowledge of the need for a total program of education, are advocating that science, mathematics and languages be substituted for some phases of vocational education. This fad will in time run its course. The need for vocational education in agriculture will continue."

It is my sincere belief that I gave this teacher good advice. Changes in the teaching content must occur. The instruction must keep pace with changes in agriculture. In some rural communities—due to business and industrial developments—the need for vocational agriculture will cease to exist. But the need in the nation as a whole—with some shifts in emphasis—will become increasingly important in the years ahead. If our nation's population continues to expand at the present rate, there may come a time in the not too distant future when we will have a shortage of farm produced food and fiber rather than a surplus.

M. D. Mobley, Editor-in-Chief
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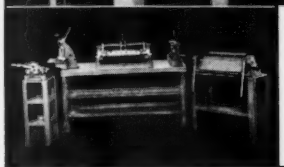

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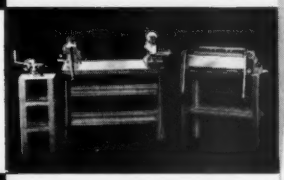

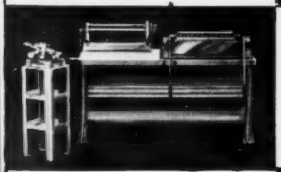

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Official tellers Clare M. Godfrey, James L. Pope and Arlyn F. Olle had a busy day! AVA staff members joined them in their project.

LOGAN TO HEAD AVA

Dr. William B. Logan, Professor of Distributive Education and Director of Management Institutes at Ohio State University was elected to succeed E. M. Claude of Illinois as AVA President for the 1960-61 membership year in the Association's fourth presidential-election-by-ballot March 10.

Official tellers, appointed by the AVA Executive Committee, were:

James L. Pope, vocational agriculture teacher, Gaithersburg, Md., Chairman;

Clare M. Godfrey, business education instructor, Washington, D. C.; and

Arlyn F. Olle, trades and industry teacher, Washington, D. C.

Official announcement sent to the AVA Executive Committee from the tellers read:

"In compliance with provisions of the AVA Construction, this is to certify to the Executive Committee of the American Vocational Association, Inc., that

WILLIAM B. LOGAN, Professor of Distributive Education Ohio State University
Columbus, O.

has been duly elected AVA President for the 1960-61 year by virtue of the fact that he received a majority of the votes cast by AVA members from a careful count by authorized tellers of the ballots mailed to the Washington headquarters office of the AVA 'postmarked not later than March 10', 1960.

"We further certify that when we began our duties as tellers, we found that all ballots received in official designated envelopes marked 'Ballot' were unopened.

AVA Election Tellers, 1960"

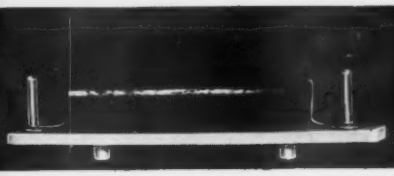
BALLOTING RESULTS

STATES	*Percent of members who voted*
Alabama	29.4
Arizona	42.5
Arkansas	20.3
California	35.3
Colorado	36.6
Connecticut	24.2
Delaware	38.0
D. C.	27.5
Florida	27.7
Georgia	17.1
Hawaii	18.2
Idaho	36.4
Illinois	23.9
Indiana	27.9
Iowa	31.5
Kansas	25.3
Kentucky	15.0
Louisiana	18.1
Maine	36.1
Maryland	36.6
Massachusetts	19.5
Michigan	35.9
Minnesota	27.3
Mississippi	19.8
Missouri	28.0
Montana	30.9
Nebraska	31.9
Nevada	30.9
New Hampshire	34.2
New Jersey	23.6
New Mexico	21.3
New York	27.0
North Carolina	26.1
North Dakota	21.6
Ohio	44.8
Oklahoma	17.1
Oregon	38.9
Pennsylvania	29.3
Rhode Island	22.5
South Carolina	16.3
South Dakota	18.8
Tennessee	17.1
Texas	21.9
Utah	17.3
Vermont	26.8
Virginia	27.7
Washington	58.9
West Virginia	24.6
Wisconsin	23.4
Wyoming	27.9
Canada	34.5
Puerto Rico	21.9
Philippines and Free China	2.5
Total	26.5

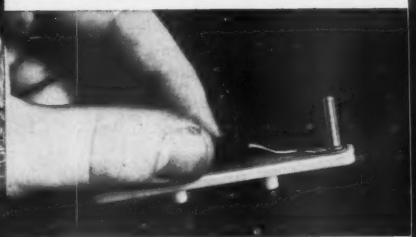
"My Students Learn Electricity and Electronics Easier with the ErecTronic® System"

Mr. Stanley Gardner, electronics instructor at Newton Technical High School, Newton, Mass., whose statement appears above, is shown observing two students who are constructing a circuit from an EIA Manual.

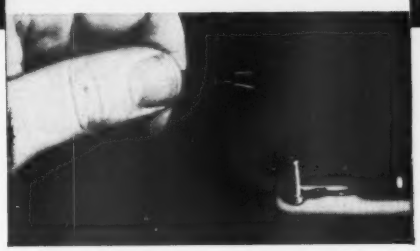
Here's Why ErecTronic Kits Make Learning and Teaching Easier!



Components and other parts are factory-mounted on high-impact polystyrene bases which have two plug in pins.



Precision-drilled Duron lids provide working surface which holds mounted parts firmly, yet allows easy removal.

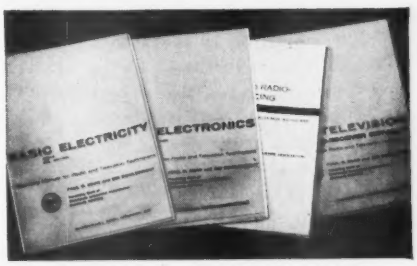


This phosphor bronze Jiffy Connector used in ErecTronic Kits has made over 7,000 positive electrical connections. It still retains its initial resiliency.

The ErecTronic System of Laboratory Instruction makes the teaching and learning of basic electricity and electronics fast and practical. Students can build and rebuild circuits on a peg board without soldering with simple plug-in mounted components and Jiffy connectors. Supervision and checking time is reduced. Working from Electronic Industries Association Manuals, students can build circuits as fast as they can think.

These EIA (formerly RETMA) Manuals provide a laboratory program of over 125 jobs in logical sequence from which the student learns basic technical knowledge starting with Ohm's Law and progressing to television receivers, including transistors.

ErecTronic Kits are economical because parts can be used over and over again, and silk screen storage panels provide quick visual inventory check. Write today for new Catalog ED-6.



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T and I in the 60's

A PROMISE WITH PROBLEMS

By James R. D. Eddy

A QUICK LOOK backward at the 1950's tells us that we have come through a decade of turmoil, hot wars, cold wars, and an ever-increasing acceleration in the rate of change. Things which were not dreamed of in 1950 are realities in 1960. Automation and precision manufacturing have reached heights never experienced before, and the space age is emerging rapidly.

We have entered a decade that will reap the benefits of expanding programs of research and development that came about in the 1950's. Such things as plastic houses, television pictures on the wall, fuel cells that provide electric power, air suspension vehicles, and thousands upon thousands of new synthetic products are all part of the present decade. The last decade saw budgets for research and development increase four-fold; we can expect these budgets to continue to increase at that rate during this decade—until we can say, in the vernacular, "You ain't seen nothing yet!"

INEVITABLY, education must keep pace with the dynamic sixties. Caught in the maelstrom of rapidly changing events, public education in the 1950's was subjected as never before to severe criticism. In many cases the critics were not competent to criticize. Individual critics looked at the educational picture from narrow viewpoints. Ignoring the total scene, they asked simply for more science, more mathematics, or more technicians. Nevertheless, if we have learned anything from our experience in the fifties, it must be that we can never be complacent about our educational programs. The need for alert, constant re-evaluation is particularly necessary in the field of trade and industrial vocational education, which is—or should be—continuously affected by changes in the occupational world.

The extent of the task at hand is shown by the fact that the progress promised in the 1960's will require that almost 30 million people enter the labor market. They will replace about 16 million of the present group who will retire or leave the labor force for other reasons, and they will fill 14 million additional—and in many cases entirely different—jobs. One estimate is that of the 30 million people entering the labor force 26 million will be young people beginning their careers.

WHAT SHALL WE in trade and industrial education be doing to help?

Obviously, we must first look for trends that will tell us what jobs the young people will need to fill. With such a task at hand, we cannot afford to waste time or effort preparing people for jobs that are becoming uncommon or disappearing. Employment in the rapidly growing service industries will continue to grow faster than in all other fields. The service industries will be a primary source of employment.

Estimates are that there may be an increase of as much as 60 per cent in the number of so-called professional, technical, and related workers. This means more engineers and many more technicians.

There will be a critical shortage, according to James P. Mitchell, Secretary of Labor, among the expert "blue collar" workers. The average age of our present highly skilled craftsmen is quite high, and we certainly do not have enough replacement apprentices.

The ten years ahead present a time of decision for trade and industrial education. In the decade we have now entered, we can emerge as a strong and active educational force or we can become a minor force. Unless we accomplish the task at hand, we will play second fiddle to a new force that will be created to meet the needs of society for vocational-technical education. To succeed, we will require the utmost honesty in our self appraisal and the willingness to change, sometimes anticipating change before it actually happens. As one of my friends said "We shall see, within the next decade perhaps the first real effort to be intellectually honest—to reappraise—to consider the concept that the generalist and the specialist are concerned with the same set of educational goals."

In this decade we need to carefully evaluate our existing programs to determine if they have kept up with the changes in modern industry. We cannot neglect the less glamorous occupations in favor of those occupations which demand highly technical skill and knowledge. We cannot forget the high school boys and girls who will terminate their education at the 12th grade but by the same token we cannot concentrate on them. We must be flexible enough to look after their interests while at the same time concentrating on technical and extension education

Mr. Eddy is Dean, Division of Extension, The University of Texas, Austin

THE MOST DOMINANT FORCE WILL BE THE NEED FOR HIGHER QUALITY PROGRAMS

IN TRADE PREPARATORY EDUCAtion, certain trends are apparent. Indications are that on the secondary level there is a developing trend for many of our industrial vocational shops to provide broad basic training for a family of trades rather than training for a specific trade.

Considerable evidence points to more training being needed on the post-high school level—the 13th and 14th grades, the area vocational school, or the technical institute.

The most dominant force in our trade preparatory education will be the movement for higher quality in all the programs. This means better selection of students, better shop and laboratory facilities, and upgrading of teachers. It also means that we must obtain increased utilization of committees from business and industry to assist in making analyses determining curricula, and in obtaining specialized equipment when it is vital to training.

The emphasis in trade preparatory programs is going to shift gradually from manual skill to related technical knowledge. To put it another way, there will be considerably more tendency to emphasize "know why" rather than "know how." The craftsman of the future will have to make many decisions, and it is becoming increasingly important that he acquire more technical and related information than in the past. Much of the technical and related information the future craftsman must know will have to be taught on a broader base than that of the narrow application experienced in many of our day-trade programs at present. This requirement may mean that a different type of related subjects instructor will be needed in the future.

The mobility of our population, as evidenced by the fact that 20 per-cent of the people move every year, means that national standards of achievement are needed in all basic craft programs. A boy trained in a vocational shop in Texas should attain the same levels of skill and knowledge of related information as would a boy trained in a similar shop in Detroit, Michigan. It is quite possible the Texan may move to Detroit.

THE ESTABLISHMENT of programs for technical education will try our ingenuity and resources to a high degree. Technical training in general requires a beginning student who has completed high school. For this reason technical education will be primarily on the post-high-school level, and will be presented either by a junior college or by an area vocational-technical institute. This decade will definitely see the idea of area vocational-technical institutes involving the 13th and 14th grades being accepted in all states. The needs of technical education will not be met by pulling together a few applied science, mathematics, drawing, and laboratory courses into a general curriculum that does not have specific occupational objectives. When we consider our technical education programs from the standpoint of being occupationally centered, we find an entirely different problem which requires that we turn to industry for considerable assistance in developing training programs. We must be careful to ensure that such programs meet the best needs of the individual student as well as of industry.

One of our greatest problems in the 1960's will be the upgrading of many of our older instructors who have been accustomed to teaching basic courses in accordance with out-of-date analyses and objectives. In addition, much of the equipment in our older shops is obsolete, and manipulative skill mastered on such machines has very little value in industry today.

There is a real challenge to improving the quality of existing programs. Unless we improve the quality of these programs we cannot expect to attract the better students. Without better students and without higher quality results from training, we cannot expect industry to accept our trainees.

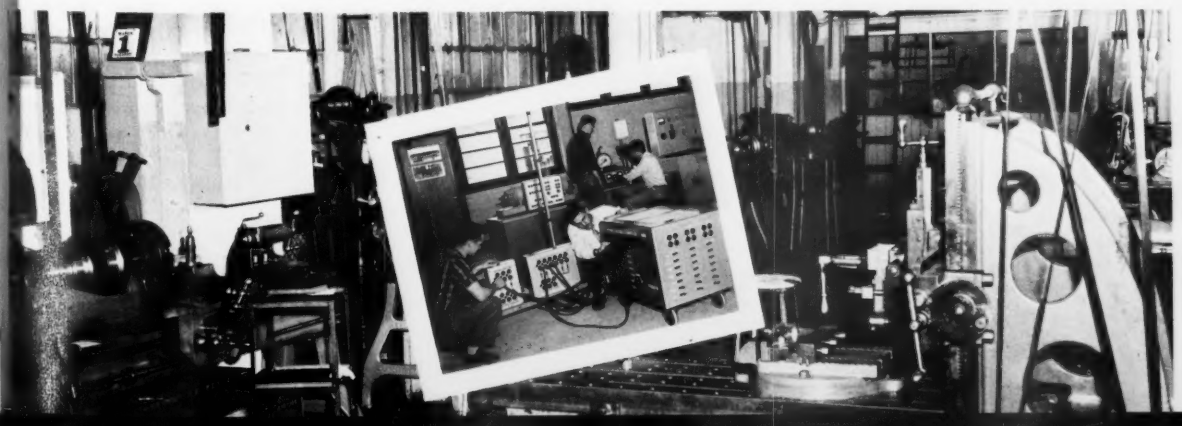
THE NEED FOR EXTENSION TRAINing programs for apprentices and skilled craftsmen will continue to increase during the next decade, largely because rapid changes occurring in business and industry will require additional capabilities from workmen and the retraining of displaced craftsmen.

Technology will demand high quality in apprentice training programs. Much of the student capability is not being utilized at present. The average apprentice of today is a high school graduate, yet many of our programs of related instruction for apprentices are based on a level of education below that of the 12th grade. During the next decade we will see a continual advancement in the level and quality of the related instructional program for apprentices. There will be a greater use of supplementary laboratory and shop training. Training will be given in certain skills that are impossible to obtain on the job for various reasons.

Beyond the apprentice level, the increasing level of skill and technical knowledge required of skilled craftsmen is such that many more programs of training for them must be developed

(Continued on page 29)

THE OLD ORDER CHANGETH



By Howard O. Meuche

Willingness to Work + Willingness to Learn = PROGRESS

MUCH ELOQUENCE has been expended in both the written and spoken word in an effort to define and resolve our so-called "school problem." Inadequate teachers, inadequate facilities, low teacher standards, low teacher salaries are but a few of the many arguments advanced for the state of our present educational programs.

Seemingly ignored is the factor of the student's willingness to work and learn. If we think of education in terms of equipping an individual for a subsequent place and status in society we must necessarily relegate to education, along with its broader aspects, the training in specific areas of achievement. It is here where the educational process is presumed to have totally fallen down. Students, we are told, are ill-equipped, ill-adjusted, and ill-trained to take their place in today's society.

This problem is not peculiar to the school system by any means. Every manufacturing business is in some respects an extension of the classroom because here, more than ever, it is necessary for the employee to learn in order to advance.

It might be well at this time to review some basic economics in connection with the matter of employment. With perhaps some notable exceptions, no company is in business simply to provide employment. Rather, it is in business, or at least should be, to make a profit or a return on the money invested in it. If this is the ultimate goal, then the manpower, machines and money must in somewise contribute to the making of a profit. The company or employer can hardly be regarded as a philanthropic or benevolent organization. Today this statement sounds calloused, yet most people value their self-respect far more than any patronage an employer might see fit to bestow.

There is really only one qualification to be met. Does the employee contribute to the making of a profit, either directly or indirectly? If he does, there has been a fair exchange of money for services. And, if not, he must be considered a liability which cannot long be tolerated. This basic fact seems to have totally eluded the majority of

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Mr. Meuche is President, Universal Scientific Company, Inc.

"AS THE TWIG IS ROOTED, SO THE TREE SHALL GROW"

both our high school and college graduates, as well as their parents. Today's students do not even vaguely attempt to define in their minds the potential value of their services to their employer. It is rather a question of how much is their employer willing to pay for their august presence on the premises. No manufacturer would blindly invest several thousand dollars in a new machine without knowing its capabilities or limitations, yet young people expect this same manufacturer to hire them at the highest possible figure when the only evidence of their potential is a diploma, however earned.

NO EMPLOYER expects to hire people without expending some money for training. It is in this area that industry parallels or extends the educational process. Quite obviously, if a manufacturer has already invested several thousand dollars in training an employee it behooves him to consider those people already within the organization for advancement or additional training. Many companies have almost a fixed policy of advancement from within, but even these sooner or later find themselves in a position where outside talent must be sought. Far too often this stems, not so much from an absence of available talent or intelligence, but from an absence of initiative or willingness to work and learn. It seems so much easier simply to accept one's job, do what has to be done and not one whit more, never inquire how or why, and in general become and remain as inconspicuous as possible.

A week hardly goes by without some announcement of another technological advance. The field of electricity and electronics, for example, has become so advanced and so complex that the average electrician often finds himself at a total loss when confronted with some of the recently developed control panels. It is true that extension and correspondence courses are offered in many areas, yet how many avail themselves of this opportunity to learn? In this connection it should also be stated that many manufacturers are themselves derelict in not more actively developing programs for the advancement or up-grading of various skills.

Unions have recognized this problem and here and there concerted steps are being taken to upgrade the technical skills of qualified people willing to learn. Certainly it is an encouraging sign to hear not the clamor for job security but for job advancement by additional learning and skill improvement.

IN EDUCATIONAL CIRCLES the battered phrase "motivation" seems to be a key word. It seems, further, to be almost synonymous with amusement. Apparently if a student's interest can't be held then there is something wrong with the way or the manner in which he is being taught. This would seem to put the educational process in the same category as a television show. If it doesn't amuse or interest, one simply ignores the whole performance. It seems a curious circumstance that our students find themselves in a position wherein they can virtually dictate the acceptance or rejection of knowledge or its presentation.

IF LEARNING can be assumed to involve an expenditure of energy on the part of both the teacher and student, then it must necessarily follow the laws of the conservation of energy. Simply stated, the output can never be greater than the input. Further, if we attach "weight" to the words or actions of learning, this expenditure of energy may also be termed as work. That learning or self-improvement involves work is another factor of education that must be recognized.

It strikes even the casual observer that our educational problems do not lie entirely with the "deficiencies" of our schools, our systems, or our teachers. To paraphrase an old adage, "as the twig is rooted, so the tree shall grow."

We must once again re-establish and re-affirm the basic principles that led to our present growth and economic system. There is no short-cut to learning and self-improvement and the only prerequisite to knowledge and progress is the willingness to work and learn.

"We must once again re-establish and reaffirm the basic principles that led to our present growth and economic system.

"There is no short-cut to learning and self-improvement. . . ."

THE U. S. DEPARTMENT OF LABOR REPORT

Adequate Manpower In The 1960's— A New Challenge for Vo-Ed!

By Margaret Troxell

ESTIMATES CALL for 29,000,000 new workers in this country's labor force during the 1960s. This is an increase of 13½ million over the current 73½ million. The startling fact is that workers under 25 years of age will increase by 6½ million or 46 per-cent.

This forecast, with all its implications to educators and vocational counsellors, appears in a new United States Department of Labor study, *Manpower: Challenge of the 1960s*, issued by Secretary of Labor James P. Mitchell. The theme of youth recurs throughout the study. It points out that 18 is a critical age because it is at that time that the average person either enters the labor force and becomes a worker or goes on to college.

New jobs are evolving almost daily in this age of technological marvels in industry, Secretary Mitchell said recently in discussing the matter of manpower. The only answer is to counsel youth, which represents the largest segment of growth in the labor force, and to train and re-train today's workers.

In many instances industry itself cannot make long-range plans since there are over-night changes in materials and other drastic changes because of automation. Leading firms recognize the dearth of craftsmen, that such shortages must be met if the ideas of the engineers are to evolve from the drawing boards into solid forms, and be produced and put into operation at minimum cost.

THE 1960's will see the largest growth in job opportunities in such occupations as professional, managerial, clerical, sales and skilled workers. Little change will occur among unskilled laborers and farmers, and farm workers will continue to decline.

This trend immediately emphasizes the great importance of education and training. Only the most thorough education in schools, apprenticeship training, and training on the job will make it possible to match the growing number of workers with the job demands. Though 7 out of 10 workers will have a high school diploma or better, which is a considerable increase in the educational level of all workers, it is a deplorable fact that there will be about 7½ million boys and girls who will drop out of high school before graduation. The drop-out lacks the education required to enter the growth areas of employment opportunities.

"The 60's will see the largest growth in job opportunities in such occupations as professional, managerial, clerical, sales and skilled workers."

EVERY WORKER IS VALUABLE IN TERMS OF THE DEMANDS OF OUR ECONOMY

Not only educational training must be continued for these young people to the extent that they can absorb it, but courses designed to meet their particular needs must be developed. Educational levels of all workers must be improved. Governments—Federal, State, County and Local—must recognize the need for training as must communities and employers. Training must be beamed to meet the new technologies arising daily, to meet new methods, to meet problems of automation, to meet even the differences in the composition of the work force. Each is an integral part of personnel planning on the part of industry.

OTHER WORKERS by age in this largest 10-year jump in the history of our labor force appear at the other end of the age scale. A 20 per-cent increase or 5½ million persons over 45 years of age is forecast while those between 25 and 34 years of age will increase by 12 per-cent or 1¾ million. Actually workers from 35 to 44 will decrease by some 200,000. This uneven distribution in the labor force is significant. Management has traditionally selected its supervisory and executive personnel from the 25-44-year-old group.

Industry cannot overlook the woman worker. This category will increase by 6 million or 25 per-cent. It is estimated that one out of every three workers in 1970 will be a woman. It follows women will have to be introduced into occupations they may not now fill.

Another group of workers which will increase during this decade is the individual who wishes to work part time. This segment of the work force will pass the 15 million mark by 1970. Industry will have to position itself in terms of management to hire part-time workers.

These predictions will require a major overhaul in the employment policies of many businesses. Employers must abandon policies against hiring and up-grading workers because of age, sex, race, religion, nationality or because they may be handicapped. Some 29,000,000 new workers will be needed to meet the expected increase in the labor force and to replace workers who die, retire, or otherwise become unavailable for work.

18 is a critical age . . .

THE MOST DEMANDING task will be in those areas requiring the most education and the most training. It is true that today more persons are employed in the production of services than in the production of goods. More people teach, work for government, financing, and transporting materials than in construction, agriculture, mining or manufacturing.

There is no question but that the 1960s will present a challenge—a challenge to our ingenuity, to our creativity and to how we handle our manpower resources to channel the people to accomplish the work that has to be done. Every worker is valuable in terms of the demands of the economy, and human resources must be conserved to keep every worker on the job.

But this decade has much promise. This is reflected in the standard of living. The manpower study of the Department of Labor estimates the 1960s will close with a gross national product, a total in goods and services, of $750 billion. This is a 50 per-cent increase over the beginning of the decade and can mean a 25 per-cent increase in the standard of living for the individual citizen.

Some ups and downs may occur in the business cycle as they did in the 1950s, but the study assumes this country will continue the same high levels of economic activity. No serious deterioration is expected in the international field, and technological gains are expected to progress at about the same pace as in the 1950s.

Beginning the 1960s with close to 180 million persons in this country and expecting to end it with approximately 208 million, Secretary Mitchell is convinced we have the manpower and the technology to fulfill their wants. "It will take much hard work and imaginative thinking on the part of government, industry, the community, and educators to assure maximum utilization of this tremendous labor force," he said.

MAXIMUM UTILIZATION is based on training. Older workers need to keep up-to-date. Part-time workers, including working mothers, will need training as will minority groups, whose talents, skills and abilities are often greatly undeveloped and unused. Young members of the dwindling farm population will need special education and guidance to help them adjust to non-farm jobs and compete for work in urban areas.

TO ASSURE adequate manpower in the United States in the next 10 years, Secretary Mitchell recommends:

Improving individual competence, present and prospective;

Using all manpower resources without regard to race, sex, age or physical handicap;

Striving to place every worker in a job that best fits his talents and then putting these talents to work to their fullest on the job;

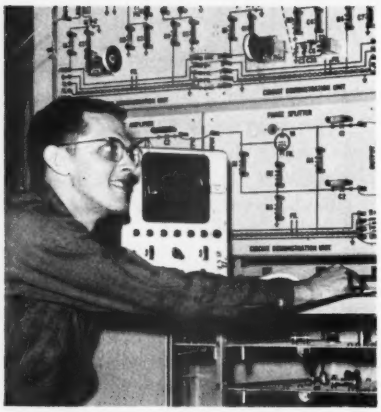
Assisting every worker to develop a sense of purpose and pride in his job;

Preparing now for new and changing manpower needs within the total work force;

Developing jobs for all variations of worker capabilities; and

Planning on the full use of better quality as well as increasing quantity of manpower.

Mrs. Troxell is Information Specialist, Bureau of Apprenticeship and Training, U. S. Department of Labor



TECHNICAL EDUCATION NEW JERSEY-STYLE

By George W. Morgenroth

IN GENERAL, it is recognized and more recently emphasized by the Conant report that an academic high school cannot be efficiently conducted by a small school district. It is also recognized, to a greater extent, that professional schools such as medical, dental, law or engineering colleges must be operated, except in very large centers of population like New York City, on a statewide or larger area basis. It is equally true, but not equally recognized, that almost all vocational education and particularly industrial and technical vocational education needs to be based on a large operating unit. We are gradually making strides in this direction through the recently adopted National Defense Education Act covering area technical education.

In some areas the vocational and technical schools are operated by the state; Connecticut and Wisconsin are good examples. However, in more and more states the county-wide school is gaining favor and this system has proven very successful in the state of New Jersey.

How to do it? I will be specific and describe how it was done in the Essex County Vocational and Technical Schools, New Jersey.

VOCATIONAL EDUCATION in New Jersey had its first real impetus in the enactment of legislature of 1913 when a law was passed approving the establishment of county systems of vocational schools.

Today the Essex County system involves five separate schools, a complete central office facility, a number of programs located in various industrial and labor centers and a public service training program located in a National Guard Armory.

This system serves the County of Essex, New Jersey, which is one of the most highly industrialized counties in the United States. The population is slightly over 1,000,000. It contains 126 square miles and it is comprised of 22 separate units of municipal government which contribute to the cost of county services on the basis of assessed property valuations in each. Newark is the principal city of the county and is the site of the county offices. In this County of Essex, there are 21 local school districts each operated by a separate autonomous body called a Board of Education. The County Vocational Schools also operate through an autonomous body known as the Board of Education of the Vocational Schools in the County of Essex, New Jersey. This body is separate and apart from the other local bodies. However, the students attending the County Vocational and Technical Schools come from the local school districts of the county, free of tuition, and in most cases, their transportation to and from the school is paid for by the local school district.

THE ESSEX COUNTY Vocational and Technical Schools offer the following programs and services to residents of the county:

- *Vocational High School*—specialized high school courses which prepare for work in the skilled trades.
- *Technical High School*—preparation for technical and semi-professional occupations.
- *Adult Technical*—for those completing high school or the equivalent. Courses vary from ten months to two years preparing intensively for specialized trade and technical positions.
- *Evening School*—upgrade training for workers who wish to advance in the field in which they are currently employed.
- *Apprenticeship*—to meet the related technical instruction requirements of apprentices functioning in a bona fide apprenticeship program.
- *Foreman and Conference Leadership*—to meet the needs of supervisors and foremen in business and industry in working with people.
- *Short-Unit Courses*—to meet specific training needs of individuals in production or semi-production jobs.
- *Guidance and Placement Service*—to assist individuals in their needs through counseling and placement in jobs in both business and industry.

DURING THE EARLY part of 193[illegible] we found that we were being besieged by requests from a number of young people who were high school graduates for specific training to fit them for employment because they lacked experience and employment opportunities were very scarce. A study and survey were planned of our county and its surrounding area to determine the needs and it was found that more technical preparation was being demanded by the industries and because of the lack of employment opportunities the employment age was raised several years which made it practically impossible for a recent academic high school graduate to receive any employment. In view of these conditions a study of the courses offered was made and several curricula were revised to meet the needs by introducing more technical

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SHOP, LABORATORY AND TECHNICAL RELATED INSTRUCTION IS INDIVIDUAL

material. As an outcome of this work there was introduced a series of vocational technical courses in such fields as Technical Industrial Electricity, Manufacturing Technics, Mechanical Drafting and Design, Medical Assistants, Dental Assistants, etc.

About January, 1945, just prior to the closing of the War Production Training Program, another study and survey were conducted and it was found that a definite need existed for a program of training that would provide post-high school youth and adults with technical training in a number of fields such as the Electrical, Mechanical and Construction fields and the Medical, Dental and Nursing fields. As an outcome of this survey the administrative and supervisory staffs of the schools made up a committee to study vocational and technical education as offered throughout the country by the various private and public institutions on an adult basis. Along with this study the committee made many visits to both private and technical institutes to discuss and see how these institutes were meeting the needs in their respective areas. Early in 1946, the study was completed, and the committee presented their findings in the development of policy, requirements for admission, and the plan for operation of the program. This the Board of Education and the Advisory Committee approved, and the program started in September, 1946.

THESE OBJECTIVES were adopted: "That the courses established on a technical high school and a post-high school level be operated for the clearly avowed purpose of giving thorough vocational technical instruction to the students to the end that they may be prepared for profitable and efficient employment in a democratic society."

THE PURPOSE of the Technical High School program is to offer capable students a high school education plus technical and scientific knowledge with some saleable hand skills which will prepare them for employment.

The purpose of the Adult Technical School program is to offer to mature students an education which will prepare them for specific jobs or fields of employment and to provide job improvement or upgrade training for those already employed.

THE INSTRUCTION is intensive in both the Technical High School and the Adult Technical School programs, and it takes a student of above average ability to do the work and complete it in the prescribed time. However, in the Adult Technical program it is designed particularly for the mature individual who can spend only a limited amount of time in a full-time school.

THE TECHNICAL High School courses start at the tenth year and operate for three years granting a regular high school diploma upon completion of the twelfth year. The courses operate on a six-hour per-day basis, and the time is divided approximately to 3 hours for technology laboratory and the sciences, 1½ hours for shop skills and 1½ hours for academic subjects such as English, history, social studies, health and physical education.

The Adult Technical School courses are post-high school and vary from 10 months to 2 years in length. Upon completion of the course an Adult Technical School diploma is issued. The courses operate on a six hour per day basis, and the time is divided 3½ hours for technology laboratory and the sciences, 1½ hours for shop skills and 1 hour for English and the humanities.

IN BOTH the Technical High and the Adult Technical programs the courses are terminal courses, that is, they prepare students to leave school and take positions in industry, business or commerce. The content of the courses is based on job requirements. However, since it is important not to close the door to further education on the part of the students displaying appropriate abilities, we encourage students to go on to college and engineering schools. In the case of the Technical High graduate he will have the required credits for entry into many colleges, and many have been admitted to engineering school.

For the Adult Technical graduate arrangements have been made with some local colleges to grant some credit for units of instruction taken in diploma courses. This does not mean that any of the courses offered duplicate college courses. However, the technical field parallels the engineering field in many places. The courses in the Adult Technical program place a much greater emphasis on shop and laboratory work than engineering courses do, and the technical work is more specifically applied. This means that these courses meet the needs of and appeal to students who have somewhat different backgrounds and interests and job objectives than engineering students. However, some students find that some of these more specific courses which offer much shop and laboratory work develop their understanding of technical problems to a point where they desire and are able to go on into engineering work. For such students, we endeavor to seek, promote and obtain cooperation with colleges for granting liberal credits for work accomplished.

IN THE TECHNICAL High School courses students must have completed the ninth grade with more than a satisfactory grade, they must have an I.Q. of better than 100 and must come recommended by the principal of the sending school. At our school they are given a differential aptitude test and may be given a battery of other tests if our counselor is in doubt as to their ability to profit by the instruction.

Those seeking admission to the Adult Technical School courses must have completed four years of high school or the equivalent and must have the ability to do the work required. Those who have less than four years of high school may be accepted if they have had other experience such as business or industrial jobs or service in the armed forces which, along with tests of their native ability, indicates that they can successfully do the work required.

INSTRUCTION IN SHOP, laboratory and technical related work is on an individual basis so each student may proceed at the speed best suited to his or her ability. The academic work is generally given on a small group basis with individual projects and reports made by each student.

THERE ARE TWO counselors in each of our schools who help each student to study his problems and to assist in planning a program that will meet the individual's needs. These counselors are experienced occupational advisors. Also, the respective teachers and especially the assigned student advisor assists in the counseling of the student after his initial selection of courses is made.

ADULT STUDENTS WORK IN REGULAR SHOPS BUT HAVE SEPARATE INSTRUCTION

The school system has a central guidance and placement department. This department works in close cooperation with all school counselors. It has a wide variety of industrial contacts and much experience in guidance, placement, and follow-up.

There is no tuition charge for residents of Essex County as the school system is supported by taxation. For non-residents, a tuition fee of $400 per ten month school year is charged.

IN DEVELOPING the courses and establishing the technical programs, the matter of how and where these courses should be offered presented a problem. After considerable discussion and planning, it was decided to try them in our four vocational high schools where we had adequate space to care for additional students. The technical high school students oriented themselves and with separate schedules fitted into the overall program of studies very nicely. The adult technical school students presented a problem especially where we had an insufficient number to justify a separate class. However, by developing specific courses, with specific outlines and specific instruction materials, we were able to cope with the situation, and these students while performing their work in the regular vocational and technical high school shops, laboratories, technical science rooms and classrooms were given instruction separately while in these areas. Where the number enrolled in a course became such that there were enough to justify a separate class, such an assignment was put into effect. We experienced no great difficulty in having eleventh or twelfth year technical high school students and adult students in the same shops or laboratories at the same time. In developing the program we have made, wherever possible, the Adult Technical program separate.

TYPICAL PROGRAM OF STUDIES IN NEW JERSEY

TECHNICAL INDUSTRIAL ELECTRICITY

Technical High School Course

Tenth Year

	Periods Per Week	H.S. Credits
Electrical Shop & Laboratory (includes machine shop practice)	20	5
Electrical Laboratory & Theory	5	2½
Technical Mathematics I & II	5	5
English	5	5
Social Studies	2	2
Health Education	3	1
		20½

Eleventh Year

D.C. Laboratory	12	2
Electrical Laboratory & Theory	8	2
Physics Laboratory & Theory	5	5
Technical Mathematics III & IV	5	5
English	5	5
U.S. History	2	2
Health Education	3	1
		22

Twelfth Year

A.C. Laboratory (includes work in electron.)	12	2
Electrical Laboratory & Theory (includes work in electronics)	8	4
Mechanical and Electrical Drafting	4	1
Technical Mathematics V & VI	5	5
English	5	5
U.S. History	2	2
Health Education	3	1
Library-Study	1	0
		20

ELEMENTS OF MACHINE DESIGN

Adult Technical School Course

Thirteenth Year — *First Term*

	Periods Per Week
Mechanical Drafting	20
Applied Science (Machine)	4
Electrical Laboratory and Theory	5
Physics Laboratory and Theory	5
Technical Mathematics 11	4
English	1
Human Relations	1

Second Term

Mechanical Drafting & Production Illustration	20
Electrical and Plant Drafting	5
Machine Shop	4
Physics Laboratory and Theory	5
Technical Mathematics 12	4
English	1
Human Relations	1

Fourteenth Year — *First Term*

Mechanical Drafting and Production Illustration	20
Machine Shop	4
Applied Science (Machine)	5
Mechanics Laboratory and Theory	5
Technical Mathematics 13	4
English	1
Human Relations	1

Second Term

Elements of Machine and Tool Design	20
Tool and Diemaking	4
Metallurgy Laboratory and Theory	5
Strength of Materials Laboratory and Theory	5
Technical Mathematics	4
English	1
Human Relations	1

How ISA will define the INSTRUMENTATION TECHNICIAN

Coming up soon will be industry's recommendations for training—based on a nation-wide survey

By Abner G. Hathaway

THE INSTRUMENT SOCIETY of America has established the program of the Task Force on Instrumentation Technicians. It is my pleasure to serve as chairman of this group. We are conducting a nationwide survey of instrumentation technicians' job function. We are gathering data as to exactly what things these people do and how often each thing is done.

This Task Force has designed a questionnaire which calls for about 500 pieces of information on each plant that is surveyed. Generally this information is expressed numerically. There are numbers which tell how many people perform each of various functions and numbers which tell how frequently each function is performed.

This survey will give us many thousands of pieces of information which will all be tabulated by an electronic computer and made available for the first time. What will we do with it? Our goal is to define instrumentation technicians, in terms of what their jobs consist of and to supply this information to educators. Only after this is done—when we come to a common understanding of what is required of such a technician on the job—should we attempt to make recommendations as to what courses of training we feel are appropriate to fit a man for the work which instrumentation technicians do.

In the long run, ours are *educational* objectives. Our immediate goal, however, is to deal with what appears to be a semantic problem.

Here is an example of why our program is being carried out.

Let us suppose that we were to ask one of the members of the Task Force, J. E. Bigham, of Chemstrand Corporation, what courses of training are important in fitting men for the work which instrumentation technicians do. Then, let us suppose that he replied by describing his company's training program. Keeping this in mind, let us suppose that we ask the same question of F. W. Atkinson of Owens Corning Fiberglas Corporation and let us suppose that he replies by describing his company's training program. Next, let us suppose that we ask the same question of J. E. Warren of Monsanto Chemical Company and that Mr. Warren responds by describing his company's program. Finally, let us suppose we were to compare these three answers. Do you imagine that there would be any agreement at all between them? Of course not. They'd all be different.

Obviously, then, there are differences of opinion as to what it takes to train men for the work which instrumentation technicians do.

SO FAR, we've discussed technician training *only* with reference to the three plants in the process field that I have mentioned and not with reference to the aircraft field, or to other fields. In other words, if we were to request similar opinions from corresponding people in the aeronautical field, the textile field, the pulp and paper field, the power field, and so on, we would receive even more widely differing responses coming from virtually everyone else whom we would ask.

Yet, and please bear this in mind, all these men are experts on instrumentation technician training within their respective fields!

Mr. Hathaway is Chairman, United Electronics Labs, 3947 Park Drive, Louisville 16, Ky. This material is taken from an address he presented at the 1959 AVA Convention in Chicago

AN ABBREVIATED ENGINEERING CURRICULUM ISN'T FOR TECHNICIANS

The significance of these differences of opinion lies in the fact that the job functions performed by instrumentation people differ from company to company. In other words, the work that an instrument mechanic or technician would do at, for example, the Chemstrand Corporation is slightly different from that which the corresponding individual would do in almost every other company in the entire United States.

Furthermore, ideas vary, from company to company, as to what courses of training are appropriate for the training of men for certain job functions. The result is that, when two company's training programs differ, you can't tell whether it's because of differences in the type of work that's involved, or because of differences in the ideas of the people who designed the training programs, or whether it's because of some combination of the two. This is confusing to the educators and, because of this confusion, very few training programs dealing with instrumentation have been set up in this country's technical schools.

THE STARTING POINT in clearing up this confusion is the establishing of the identity of the people within the instrumentation field about whom we are concerned. We must first know who these people are, in terms of what their jobs consist of, before we attempt to lay out a training program by which to train other people for these jobs.

The means which the I.S.A. Task Force on Instrumentation Technicians is using to gather the necessary definitive information is a comprehensive questionnaire form. At first glance this questionnaire seems to remind one of an income tax form. Unfortunately, in order to clear up a very complicated and vexing problem, we must obtain a rather intricate mass of figures and other information. There is no easy, sugar-coated way of getting these data.

Actually, our questionnaire consists of three separate inquiries. One of these deals with pneumatic instruments and this portion of the form can be considered to be an individual questionnaire; similarly, there is a different section on hydraulic instruments and one on electronic instruments. Thus, the form includes three separate sections, one on pneumatic instruments, one on hydraulic instruments, and one on electrical or electronic instruments.

Across the top of the form is a list of typical examples of job functions such as, for example: Column 9, pertaining to the use of hand tools; Column 10, pertaining to the mounting of equipment according to instructions; Column 11, pertaining to the mounting of equipment following a blueprint and so on.

Within each of the three general areas of instrumentation that are dealt with on this form (e.g. the pneumatic area, the hydraulic area; and the electrical area), there are listed five different types of functions, such as: A, Routine Mechanical Functions; B, Repair Functions and so on. By means of check marks placed in the appropriate squares provided on the form, each of these types of functions are defined in terms of typical examples of exactly what these functions consist of. One of the more important features of this form is that there is also space for indicating *how frequently* each of the various job functions is performed.

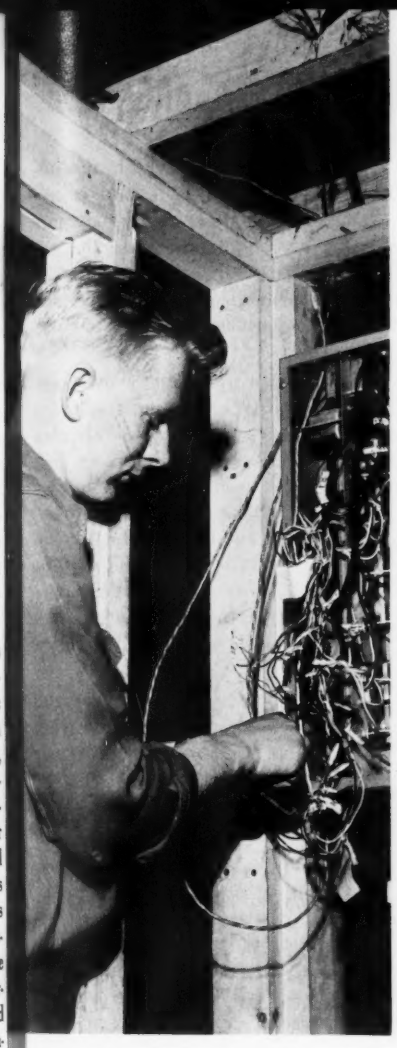
THE FINAL RESULT of this entire program, after the questionnaires have been tabulated and the results analyzed, will be a set of meaningful definitions which will provide much more specific information on the people being defined than has ever before been made available. These definitions will be provided for each of several industry groups, such as the Aeronautical Field, the Chemical and Process Field and so on.

NOW LET US consider how these definitions can be used. In a certain geographic area, such as the Houston, Texas, area in which there are many oil fields, the definitions pertaining to the petroleum industry would be most applicable. An educator in this area, desiring to set up an instrumentation training program for technicians, would be able to study these descriptions of what instrumentation technicians within this industry actually do, thus gaining familiarity with the jobs toward which his training program will lead. This, alone, would guide the educator toward the setting up of a more realistic curriculum than if he merely had called upon one or two supposedly "expert" people for advice.

But, the definitions have uses which go beyond this. Suppose the educator also wanted to gather opinions of various people in industry within his general vicinity as to what courses he should offer. In seeking this advice, he will be able to pin-point the exact type of mechanic or technician with which he is concerned, because he will have a generally accepted definition to use as a reference. Moreover, in discussing the objectives of his training program with prospective students he can accurately describe the type of work toward which the training program is to lead, instead of being forced to use such ambiguous names as "Instrument Mechanic" or "Instrumentation Technician," or the like.

It is already evident that the results of our survey will dispel many misconceptions as to just who a mechanic (or technician) is and what this man does. For example, it has been popular, in recent years, to describe the Instrumentation Technician in terms of educational achievement—or in other words, "what subjects a man should have studied in order to be one." It has been quite popular to associate this technician with what amounts to a two-year "abbreviated" engineering college curriculum. One of our leading journals in the field of instrumentation and control systems has described this technician as a man who has been "well-grounded in the fundamental sciences, in mathematics up to calculus and in control-loop theory;" then they have proceeded to ask, "Where can you find such a man?" My answer is that you can't find many of them. Why? Well, for one thing, an abbreviated engineering college curriculum just isn't the right one for technicians. It won't attract technician-minded young men because, if a man is going to study at the college level for two years or more, he may as well study for an engineering college degree. So, it would attract very few students. Moreover, if a man attempts to go to engineering college and flunks out because he can't make the grade, the chances are he won't make a good instrumentation technician, either. There is a vast difference between the type of person who makes a good instrumentation technician and the type of person who makes a good engineer.

(Continued on page 35)



FOREWARNING FROM FLORIDA

Get Ready For A Technological Breakthrough!

By Dr. G. W. Newbauer

EVEN BEFORE THE passage of the National Defense Education Act last September, concern was expressed in a number of quarters in Florida over the rapidly growing need for technicians in industry. That portion of the Act concerned with technician training, however, served to focus attention upon the seriousness of the deficiency.

To determine the present status of technician employment in Florida, the current needs for additional personnel, the potential requirements for the services of these specialists in one year and in three years, and the need for providing appropriate training facilities, a survey was conducted which was sponsored jointly by the Division of Vocational and Adult Education of the State Department of Education, the State Employment Service, and the Florida Development Commission.

A pilot study in a representative county revealed serious weaknesses in the original survey instrument. Essentially, employers were of the opinion that it was cumbersome and required too much time to complete. Hence, it was presented for revision to the Survey Advisory Committee, consisting of representatives of the participating services, selected local directors of vocational education, and other interested school personnel.

It was decided to narrow the scope of the study and to concentrate upon quantitative aspects of the problem. Consequently, the instrument was redesigned to accomplish the following purposes:

- To determine the number of technicians employed by particular industries in selected counties of the state
- To delineate the occupational areas in which these technicians were employed
- To ascertain if the present supply of technicians was adequate
- To explore the potential demand for technicians in one year and in three years
- To discover the extent to which technicians were being trained or upgraded by the firms in which they were employed
- To determine if additional training programs were needed or desired by industry.

After the instrument had been revised, it was reviewed by the State Technical Education Advisory Committee and a second pilot study was conducted which revealed a minimum of ambiguity or related difficulties.

It was believed that most technicians could be classified into nine principal occupational categories, namely, aeronautics, agriculture, chemistry, construction, drafting, electricity, electronics, mechanics, and metallurgy. Additional spaces were provided on the instrument in which employers were asked to include those technicians who could not be so categorized.

IN SELECTING COUNTIES for participation in the study, attention was directed to the types and diversity of industries represented and to the presence of military installations. Particular attention was directed to counties in which defense establishments were located, but related industries were not ignored, and provision was also made for aspects of agriculture believed to involve technicians. In this manner seventeen counties, or just over one-fourth the state total, were identified.

The aid of the local directors of vocational education or their representatives in the counties concerned was enlisted in establishing a specific mailing list of employing units to be contacted. The local directors were informed of the technician categories which had been established and of the types of industries (e.g., transportation, electronics, utilities, communications, construction, manufacturing, etc.) with which the study was concerned.

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STATISTICS POINT UP BOOMING DEMANDS IN MANY VITAL AREAS

The firms suggested were contacted by mail, and the local director served as a liaison person in his county in the event that questions of interpretation arose. However, a number of local directors expressed a desire to conduct personal interviews in some industrial establishments as a means of familiarizing themselves more thoroughly with activities in progress. They were encouraged to do so, using the survey instrument as a guide in collecting the necessary information.

It was recognized that comparable data were being obtained by means of two dissimilar devices, but it was believed that the local benefits to be derived from personal visitations by interested individuals more than compensated for any procedural variation in those cases (eight per cent of the total) in which information was obtained by means of personal interviews.

One follow-up contact by mail was made of those establishments not responding to the initial request for information, and numerous additional responses were received.

A total of 1016 employing units were contacted. Responses were received from 585 for a return rate of 57.6 per cent or a figure representing slightly under three of five firms contacted. Employing units were categorized in terms of the *Standard Industrial Classification Manual*, a publication prepared by the Technical Committee on Industrial Classification of the Office of Statistical Standards, Bureau of the Budget, and the *Directory of Florida Industries*, produced by the Florida State Chamber of Commerce.

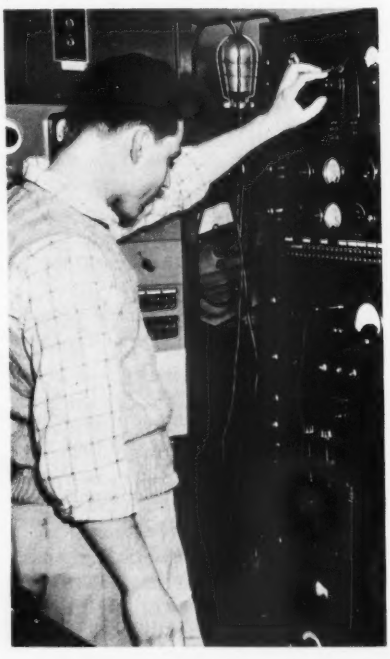
EMPLOYING UNITS responding indicated that 12,000 technicians are presently employed, but that over 15,000 will be needed during the next three years, for a projected increase approximating 125 per cent.

In the area of electronics, for example, an increase of well over 100 per cent will be required in 1963. Of primary concern, however, is the 68 per cent by which the current force of electronic specialists must be enlarged by 1961 to meet the needs of engineering and research laboratories, military installations, manufacturers of electrical machinery, equipment and supplies, producers of ordnance and accessories, enterprises engaged in the provision of communication and transportation services, and public utilities.

Architectural and engineering firms, manufacturers of electrical machinery, equipment, and supplies, and engineering and research laboratories expected to nearly double the number of their drafting technicians by 1961, while these firms, together with military installations and manufacturers of nonelectrical machinery, anticipated an increase of 75 per cent in the number of mechanical technicians needed by that date.

Electrical technicians were employed by special trade contractors, engineering and research laboratories, manufacturers of ordnance and accessories, electrical machinery producers, enterprises engaged in providing communication and transportation services, public utilities, and architectural and engineering firms. By 1963, it was estimated, nearly 75 per cent more than are presently employed will be needed.

An increase in the number of construction technicians approximating the total being utilized at the present time by building construction and architectural and engineering firms will be required in one year and again in three years, while the demand for aeronautical technicians is expected to double by 1961 and to increase considerably beyond that figure by 1963.



THE NEED FOR chemical, agricultural, metallurgical, civil, and instrument technicians was somewhat more limited, but it was anticipated that the demand for civil engineering aides would more than double by 1961 and would be almost quadrupled two years later.

It was found that slightly over one-third of the respondents employing technicians provided in-service training for these personnel, while over half favored the provision of such programs. At the present time in Florida, preparatory technical instruction in certain areas is offered or will soon be available in a number of community junior colleges and in several high schools and adult industrial education centers.

It is believed that the following conclusions and recommendations deriving from the data provide a key to further alleviating the situation:

- A balanced state-wide program of technician training must be established and maintained.
- Training programs should be provided and existing programs continued in the areas of electronics, drafting, mechanics, electricity, construction, aeronautics, civil technology, and instrumentation.
- Specialized demands such as those in electronics and drafting are sufficiently pressing and extensive for nearly all community junior colleges to participate in the training of necessary personnel.
- Other needs such as those for construction, aeronautical, civil, and instrument technicians appear to be confined to particular geographical areas of the state.
- Technical extension offerings or short courses should be made available for employed specialists in those areas and industries recognizing the need for such preparation.
- Provision should be made for technical training in secondary schools, in community junior colleges, and in ungraded programs.

In conclusion, it would appear that a technological breakthrough is imminent. Hence, a reappraisal of educational emphases is imperative if the school is to meet the challenge to greater service by which it is confronted.

THE MCDOWELL VOCATIONAL School is no longer an educational dumping ground for misfits, high school rejects, or delinquents. Ten years ago this statement would not have been true. Today, the median intelligence quotient is well above normal.

In looking back one recalls the day when industry showed little confidence in our school and was critical of our graduates' job competence. Placement of the better students was a difficult task.

Today all this has changed. Industry demands for graduates far exceed our supply. Employers are located in six neighboring states. Graduates have positions before their training is complete. Industrial representatives visit the school regularly. Students have pride in themselves and their school.

WHAT HAS HAPPENED in ten years to bring about this change? First, the staff's philosophy has changed. They initiated a plan for improving the quality of instruction by requiring a higher level of performance and a greater mastery of technical knowledge each day, each week, each month, each semester. This move prompted their study of the students.

They asked themselves "What kind of student does it take to profit from our instruction and be employed by industry?" They found that a very carefully planned selection program was needed. Today, McDowell Vocational School's demands for enrollment exceed the limits of space and facilities.

In June of each year some 200 boys, 15 years of age and ready to enter one of eight high schools, will board school buses in every part of McDowell County in southern West Virginia to make the trip to McDowell Vocational School. They come of their own free choice or at the insistence of their parents to enter the summer program at McDowell Vocational School. These boys will spend six clock hours a day for a period of forty-five days.

The 200 new enrollees constitute far more than the school can accommodate in the regular fall term. So, these young men know that the summer program is an exploratory period, at the end of which many will return to their high schools—some to enter a college preparatory course, others to take a commercial or general high school curriculum. Some will be disappointed that they were not admitted to one of the departments of McDowell Vocational School. Each one, however, has been advised and counseled in a positive manner so that he realizes he is pursuing the right course.

ON ENTRANCE to McDowell Vocational School's nine weeks' summer term things begin to happen immediately. On the first day, an intelligence test is administered by the supervisor, who is assisted by a number of teacher monitors. These tests are scored and tabulated immediately.

On the second day, an aptitude test is administered in like manner.

The end of the third day sees all tests given, scored, checked for error, and translated into Norms and Percentile Rank. Then, too, by this time students have been divided into working

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ONE YARDSTICK: CAN THE STUDENT BE PLACED IN A GOOD JOB?

groups and assigned to initial departments where they immediately begin a two-week period of exploration and discovery of new and interesting experiences. For the period that this group remains with a certain department the teacher is constantly on the alert; first, introducing new planned experiences; then watching, listening, and assessing the student reactions.

At the end of the fourth day the teacher receives from the office a tabulated sheet showing the names of his students together with their IQ's, Aptitude Scores, and Percentile Ranks. Now begins the teacher's earnest attempt to know the boy, to determine his interests and to use this knowledge in an attempt to fit him into a three-year vocational program or, perhaps return him to the senior high school. Let it be said that, at McDowell, tests are not the end. They are used as a guide or as an aid in counseling.

A PERSONAL INTERVIEW with the teacher, free from all interference and in secluded environment, enables the teacher to assess personality, previous experience, home environment, hobbies, and other information. Even during the lunch hour the student is under constant scrutiny, and he is observed at organized play (soft ball, volley ball, ping pong, checkers, and badminton) to determine his temperament, strength, dexterity, skill, and ability to work in organization.

Every two weeks the groups are rotated to new departments. As a group leaves a department, the teacher forwards to the office an individual rating sheet for each student that contains pertinent appraisals. As the groups progress and as time passes, additional rating sheets are accumulated so that by the end of the summer session there will be at least four or five rating sheets on each boy. In addition to items dealing with alertness, interest, general attitude, initiative, effort, and questions and answers, the teacher must answer this question—"Do you consider him a good candidate for vocational school? For your Department?"

The teacher also completes a report on the personal interview which includes personal information, family data, school data, church data, hobbies and leisure-time activities.

Throughout the summer this wealth of information is collected and sorted. A profile of each student begins to evolve, and interviews among student, supervisor, and teachers are a daily occurrence. Then, toward the end of the summer session, the classification of students according to tests, rating sheets, and interviews is begun. For 50 per cent of the new students the issue is not in doubt. They are accepted readily. Mechanical aptitude is average or above, intelligence score is normal or above, and these criteria (along with proven interest and initiative) usually are sufficient data on which to make classifications. There will be, however, a group of students with exceptional intelligence and very high percentile rank in aptitude. Here the supervisor must consider the possibility of a college career and a college preparatory course in high school. Since ours is a B type vocational school where all students attend academic classes for a half day, we will consider enrolling them at the request of the parents if they are able to pursue a full college preparatory course in their respective high schools.

Then, too, there is a group of students who have high intelligence and low mechanical aptitude. From this group we choose carefully. We classify, and place each in accordance with his interests, initiative, desires, and teacher rating, recommending for some the academic high school program, rather than the vocational school. The group of subnormal, those with little or no mechanical aptitude, returns to the high school to pursue a general high school curriculum. Perhaps through conferences with teachers and students there will be an occasional student in all classes referred back to the high school program if it is thought that this policy is best for the boy.

The fall term begins with a better than average group of entering students, a group that was sufficiently interested in staying with us six hours per day for nine weeks through a long, hot summer. We have learned through experience that a boy who will complete six hours of work per day in the months of June and July is a pretty good prospect for the next three years.

McDowell Vocational School has but one yardstick: *Can we place the student in a position of trust and responsibility upon his graduation?*

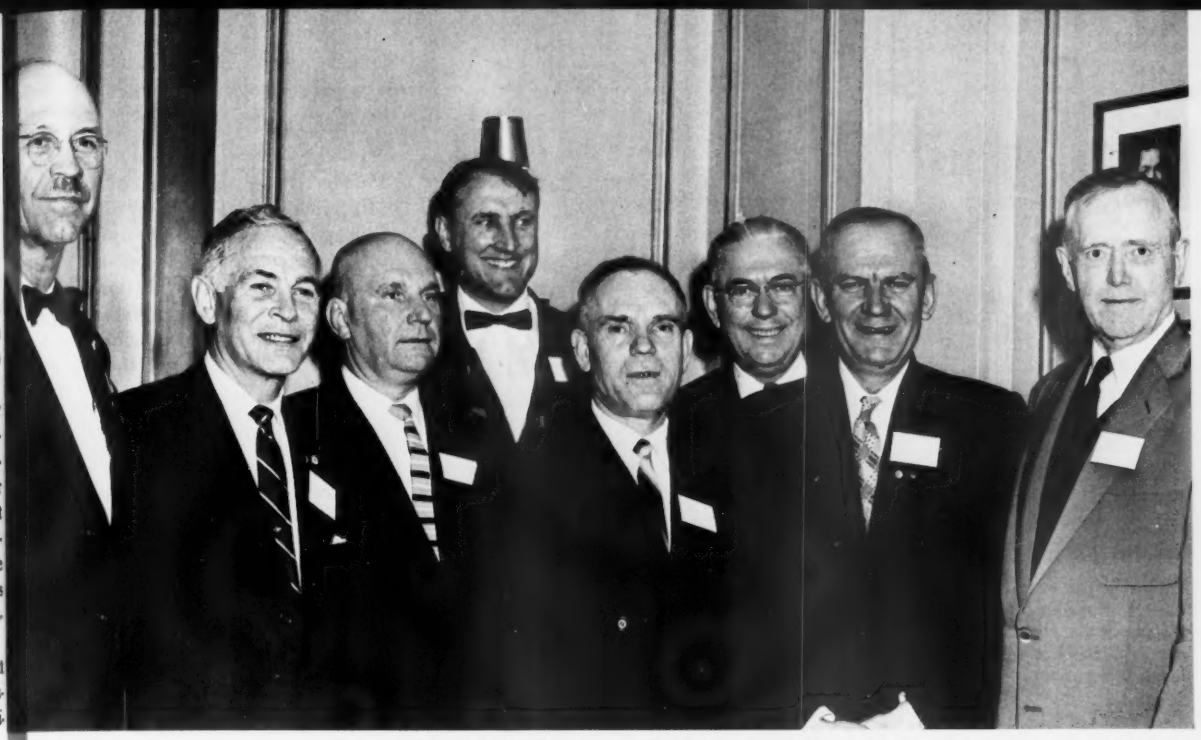
During the first semester the new students are observed carefully as they work, experiment, and learn together. A few will be encouraged to return to the senior high school at the end of the first semester. Their performance and attitude reflect the need for other types of educational experiences.

WHAT IS the advantage of our summer program? First, it will insure enrollment of only those students who should attend vocational school. Second, high school principals are not confronted with the problem of relocating and rescheduling dissatisfied students who have tried vocational school for a month—only to find it not to their liking. Third, we have a homogeneous group of students who are interested in what they are doing and who have an aptitude for the type of work they are doing. Fourth, our graduate students can be safely placed in industry because they are interested in their work and they have the ability to do a good job.

ONE STUDENT who is now a successful mechanic possibly gave us a clue to what our testing program means:

"It is a privilege to go to McDowell Vocational School!"

Yes, a privilege because their abilities to profit from instruction have been based by tests, teacher observations and counseling. The placement and success of each boy on a job is our record. And we're proud of it!



L. to r.: H. H. London, E. M. Claude (AVA President); Sergei Andreevich Zalozhnev; Nicholas J. Rokitiansky, Yakov Ivanovich Kabkov; M. D. Mobley (AVA Executive Secretary); Genrikh Iosifovich Zelenko; James H. Pearson (US Assistant Commissioner for Vocational Education)

RUSSIA TAKES A LOOK AT VOCATIONAL EDUCATION, USA

By Dr. H. H. London

A delegation of Russian vocational educators landed in this country for a two-weeks visit of technical and vocational schools Feb. 5. They were Genrikh Iosifovich Zelenko, Chairman, State Committee for Vocational Training attached to the Council of Ministers of the Soviet Union, Yakov Ivanovich Kabkov, member of the Collegium of Mr. Zelenko's Committee, and Sergei Andreevich Zalozhnev, Chief of Vocational Training for the District of Sverdlovsk.

These men were met in New York by Dr. H. H. London, Past President of the AVA, who had been asked by the Department of State to serve as host to the visitors, Harry P. Brooks, interpreter from the Department of State, and Gennadi D. Fursa, Cultural Attaché of the Soviet Embassy in Washington, D. C.

The visit was sponsored by the AVA at the request of the Department of State, under the cultural exchange agreement recently negotiated between the United States and Russia. The itinerary for the tour was prepared by Lowell Burkett of the AVA office, Robert Martens, East-West Contacts Staff, Department of State, and members of the Russian Embassy.

IN NEW YORK CITY the group visited the William E. Grady Vocational High School, New York City Community College, Stuyvesant High School, Cooper Union, a baking and meat-cutting school, the Bronx High School of Science, and the Aviation High School. Charles A. Gilbert, Supervisor of Boys' Trades Subjects in the New York Public Schools, served as local host and arranged transportation in that city.

From New York the group flew to St. Louis where they were met by Dr. J. Ernest Kuehner, Assistant to the Superintendent, in charge of Technical and Vocational Education. There the three Russian educators and Mr. Brooks, the interpreter, spent two nights in the home of Dr. and Mrs. Kuehner. In St. Louis the group visited the O'Fallon Technical High School; the David Rankin School of Mechanical Trades, and two large industrial in-plant training programs—Union Electric and Southwestern Bell Telephone Company. At the conclusion of the visit in St. Louis, Dr. Philip Hickey, Super-

Dr. London is immediate Past President of AVA and Head, Industrial Education, University of Missouri.

Front row, l to r: Harry Brooks, interpreter; Mr. Zalozhnev; Mr. Zelenko; Mr. Kabkov and Carl M. Humphrey, Missouri St. Supv. Agricultural Educ. Rear: Mr. Fursa, Fred L. Cole, District Supv., Missouri State Dept. of Educ.; C. J. Burger, Supt. of Schools, Washington, Mo.; Dr. H. H. London; Russell C. Nix, High School Principal, Washington, Mo.; and James Bailey, Supv., Vocational Agric., Missouri State Dept. of Educ.

intendent of Instruction, had a reception for the group at his home, followed by an American-style steak dinner at a fashionable restaurant.

From St. Louis the group went by automobile to Jefferson City, Missouri, where they visited the State Capitol and the State Department of Education. Then they drove to Fulton, Missouri, where they saw an automated dairy and dairy processing plant in operation. At a dinner meeting at the University of Missouri in Columbia, the group heard a brief description of higher education in the United States, with special reference to teacher education. Here, also, Mr. Zelenko explained to faculty members in some detail the Russian system of education as it exists under the reorganized plan.

The group began the second week of the tour by visiting the high school at Washington, Missouri, where Carl Humphrey, AVA Vice-President for Agricultural Education, and C. J. Burger, Superintendent of Schools, were hosts. Displayed were programs of vocational agriculture and industrial arts in operation in a small high school. A farm of one of the FFA boys was inspected so that the visitors could observe the application of classroom theory to farm practice.

While observing the splendid new gymnasium in this high school, Mr. Zelenko challenged Dr. London to a basketball-throwing contest. As the visitors and the class in physical education looked on, Mr. Zelenko shot first. The ball fell through for a bulls eye. Dr. London's shot also went through the basket. Both were equally surprised, and also afraid to take a second chance!

DR. GEORGE PARKINSON, Director of Vocational Education, was host in Milwaukee. After visiting with Dr. Parkinson and his staff, the delegation went to the Milwaukee Vocational and Adult School and City Hall, then toured the city and had dinner at the University Club as guests of Dr. and Mrs. Parkinson. The following day the group went to Waukesha, Wisconsin, where Louis M. Sasman, Chief of Agricultural Education, Wisconsin State Board for Vocational Education, and Mrs. Ruth Witte, Public Relations Director of the local schools, were hosts. Here they discussed with the principal and members of his staff problems of school organization, administration, finance, curriculum and the like, following which they visited shops, classrooms, laboratories, and a second FFA boy's farm project.

IN CHICAGO, where Dr. Hobart H. Sommers, Assistant Superintendent of Schools, was host, the group visited at some length with the administrative staff at the Board of Education Building and then went to the Washburne Trade School, which emphasizes apprenticeship training. The Chefs Training Department of the school served a luncheon. From there they went to the Lane Technical High School, where they visited shops, classrooms, and laboratories, and saw a film explaining the school's program. Following a reception at the home of Dr. and Mrs. Sommers, the group had dinner at the Palmer House as guests of Dr. and Mrs. Sommers and then attended a Chicago Symphony Orchestra concert.

The second day in Chicago the group visited the Dunbar Vocational High School, went on an extensive shopping tour, had dinner and attended an ice show in the evening at the Conrad-Hilton Hotel.

Up early on Saturday morning, February 20, the group flew from Chicago to Washington, D. C., where they were met at the airport by Mr. Burkett of the AVA, a delegation from the United States Office of Education, and a number of State Directors who were in Washington at the time. After an official visit to their embassy, the Russians were entertained at the National Press Club by Dr. Mobley and Mr. Burkett and about 50 other persons from the U. S. Office of Education, Department of State, and a number of State Directors and Supervisors. The Russians expressed their appreciation for the courtesies extended to them, indicating that they had learned much about American education, and explained at some length the system of vocational and technical education in Russia. They also expressed confidence in the worthwhileness of the cultural exchanges and assured the group that the American delegation would receive a cordial welcome in their country and would have an opportunity to see Russian schools in operation.

The three Russian educators went back to New York, accompanied by Mr. Brooks, Feb. 24. The next day they returned to Moscow by Scandinavian Airlines.

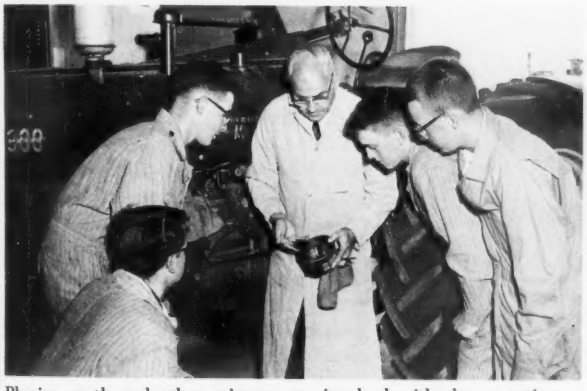
The American delegation, selected by the AVA Executive Committee and the U. S. Office of Education, will consist of Dr. H. H. London, immediate Past President of the AVA, Mark Nichols, State Director of Vocational Education in Utah, and Nicholas J. Rokitiansky, Research Assistant for Eastern Europe in the Division of International Education, U. S. Office of Education, who will be the interpreter.

Leaving for Russia around April 21, these men will visit vocational and technical schools in that country, returning around the middle of May. They plan to take numerous pictures and elaborate notes and upon their return will write a report which will be made available to members of the AVA and other interested persons.

Production of high yielding crops requires an understanding of genetics, soil science, biology and economics

Science is basic to many areas of agriculture and students must learn the principles if they are to be successfully trained

APPLICATIONS OF SCIENCE IN TEACHING AGRICULTURE



Physics, math and other sciences are involved with the operation and maintenance of farm tractors

By Joe P. Bail
CORNELL UNIVERSITY

THE PUBLIC SCHOOLS of our state and nation are being called upon to give increased effort and attention to the teaching of science and mathematics—whether it be biology, general science, chemistry, physics, geometry, algebra, trigonometry, or other specific subjects. Most of us do not deny the importance of these subjects in our modern world of science and technology. It seems appropriate, therefore, to call attention to those areas of agriculture in which science is the basic foundation and in which principles of science must be taught if students in agriculture are to receive adequate training.

Anyone associated with farming or related agricultural occupations has undoubtedly become thoroughly acquainted with such words and phrases as vitamins, trace elements, antibiotics, and weedicides or herbicides for chemical weed control, to name only a few. Other expressions such as photosynthesis, photoperiodism, cross-breeding, genes, artificial breeding, etc. have long been a part of the vocabulary of agricultural workers. And even daily, new words are called to our attention—radio-active elements, gibberelin, glandular stimulants, and tranquilizers.

WHERE DOES ALL this lead us? Let's examine the program of instruction in agriculture and see where these findings of science have application.

THE TEACHER IS THE KEY TO A TREASUREHOUSE OF IDEAS, ATTITUDES

Application of Science in Agricultural Education

Agriculture (Subject-matter Area)	*Science (Common Application)*
1. Selecting Dairy Cattle, Livestock, and Poultry.	Genetics A. Breeding B. Selection C. Production
2. Soil Management and Fertilization.	Chemistry, Bacteriology A. Plant Nutrients B. Trace Elements C. Radio-active Elements D. Seed Inoculation E. Soil Chemistry F. Fertilizers
3. Milk Testing and Processing.	Chemistry, Bacteriology A. Butterfat Test B. Pasteurization C. Buttermilk and Cheese Cultures
4. Livestock Feeding.	Chemistry, Nutrition, Mathematics A. Proteins B. Carbohydrates and Fats C. Vitamins D. Minerals E. Growth Stimulators F. Tranquilizing Drugs G. Computing Rations
5. Selecting Varieties of Plants.	Genetics A. Breeding B. Selecting
6. Controlling Insects and Diseases.	Chemistry, Biology, Entomology A. Insecticides B. Pesticides C. Vaccines D. Antibiotics
7. Controlling Weeds.	Chemistry, Botany A. Weedicides B. Selective Plant Killers C. Brush and Tree Controls
8. Agricultural Mechanics.	Physics, Mathematics A. Horse-power B. Load C. Stress D. Center of Gravity
9. Farm Machinery Repair.	Engineering, Mathematics A. Welds, Brazes B. Stress
10. Soil and Water Conservation.	Chemistry, Physics, Geology, Mathematics A. Laying out Contours, Drainage Ditches, etc. B. Soil Erosion and Soil Types C. Gravity

"Practically everything done on the farm has a background of science".

The list need not stop here. In fact, practically everything done on the farm has a background of science. Teachers of agriculture have an opportunity to do their most effective teaching when the "Why" as well as the "How" is a part of that teaching. Students generally have a natural curiosity about phenomena of nature. This curiosity can be used as a motivating force in developing an inquiring mind in students. This is not to say that an academic approach to teaching agriculture is recommended, but rather that the foundation upon which agricultural practices are based—science—can be used as a strong ally in making agricultural teaching stimulating and challenging to the brightest student in the class. Agriculture is not a dull, dead subject, but rather one as alive as the plants, animals, and human beings around us.

The Land Grant Colleges and Universities of the country, where teachers of agriculture are trained, have known for many years that a basic foundation for all their graduates includes the major areas of science. Consequently, on the average, graduates have taken from 20 to 40 per cent of their work in basic science. In addition, many applied courses in agriculture, such as nutrition, breeding, weed control, etc. are primary science courses.

THE TEACHER is the key to unlocking this treasure house of ideas, thoughts, understandings, and attitudes about agriculture and science. It behooves him to include such instruction at appropriate places in the course of study for his students, whether these students go back to the farm, enter related agricultural occupations, choose a career in science, or enter one of the many other occupations open to them.

The teacher of agriculture is indeed blessed with the rare opportunity of combining theory and practice in his teaching, both in the classroom and on the farm. This opportunity must not be overlooked if students of agriculture are to receive the training they need to succeed in their chosen field of endeavor.

T and I IN THE SIXTIES

(from page 11)

throughout the nation. The journeyman electrician needs training in electronics. The journeyman plumber needs training in the handling of many special types of metal alloys. Similar examples can be shown from all crafts.

Automation is taking over many semi-skilled jobs and is displacing workers who must be retrained for other occupations. Of the 30 million new workers required for this new decade, approximately 4 million will be individuals who are changing occupations.

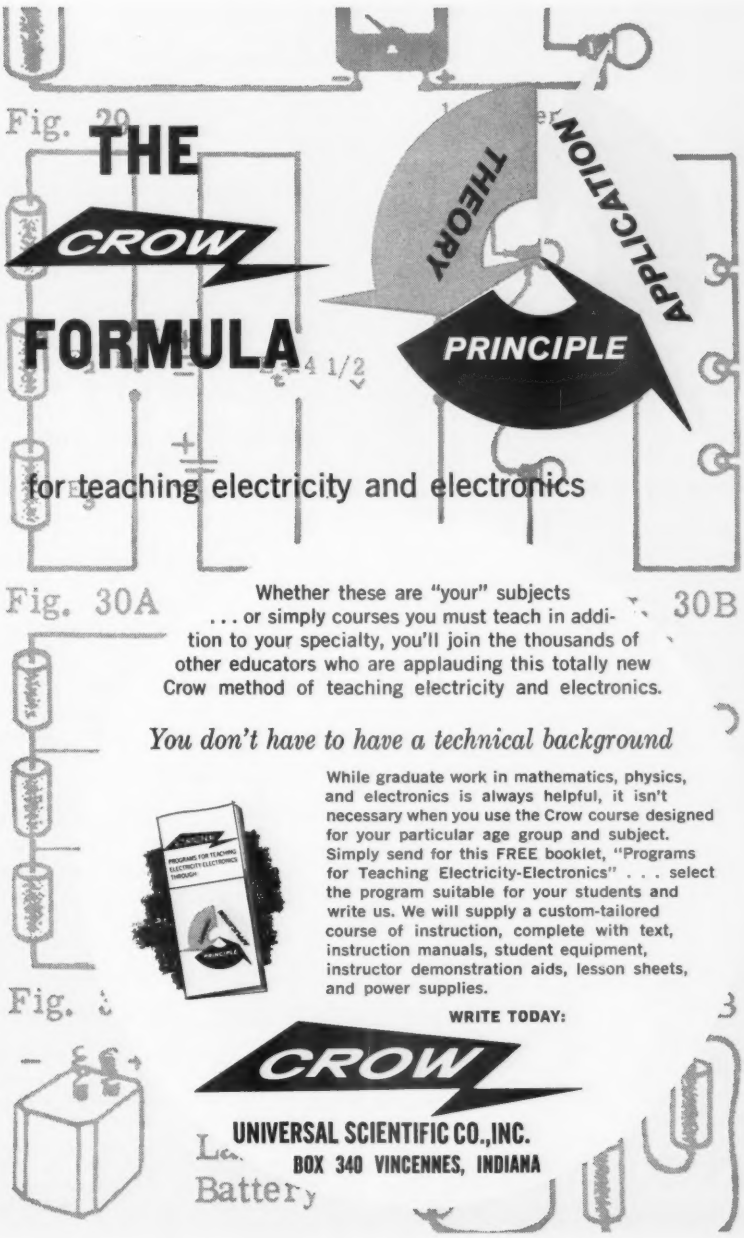
At the extension level the high cost of equipment and the short life of training programs combine to make a serious problem. Although necessary, many programs attract only a select few students and are expensive to run in relation to the number of students enrolled. This situation means we will look to industry more and more to assist in subsidizing programs of this type. Programs which are of the highest quality and are planned in cooperation with industry should have no difficulty in obtaining financial assistance from business, to the extent that it is necessary to make them available.

In this decade there will be considerable emphasis on the development of long-range programs of continuous training for employed workers. A few planned programs of several years length are now in operation. In many cases an industry can foresee its needs several years in advance and is glad to work with us in setting up such long-range programs. Special consideration must be given to the development of comprehensive programs for supervisory personnel.

Probably the greatest problem in extension training programs will be that of securing competent instructors—especially at the prices now paid for the teaching of extension classes. Usually the type of person who is best suited for extension teaching of a technical nature can, because of a shortage in his field, find all of the overtime work he wishes to do at a very high rate of pay.

SUMMING UP, the decade we have begun will call for a careful reexamination of all of the fields of endeavor and occupations in each area, in order to realistically identify the training needs for that area—determining what demands there are for new workers, and how older workers need to be upgraded. Existing vocational training programs must be re-examined critically to be certain these programs have the proper quality and meet the right objectives to serve the occupations with which they are concerned. Course content must be re-examined constantly, to determine if the most effective relationship between related and technical knowledge and manipulative skills has been achieved. Of course, the criterion for determining if this relationship has been achieved is whether or not the training produces the most desirable qualities demanded by the nature and standards of the occupation involved. Training programs on the post-high-school level must be established as needed by business and industry, and these programs should serve not only the interests of industry but also the interests of the student.

We must never be satisfied with the quality of our vocational training programs. We must strive constantly to improve them, and must remain forever flexible, willing to adapt, eliminate, or establish new programs as business and industry move forward.



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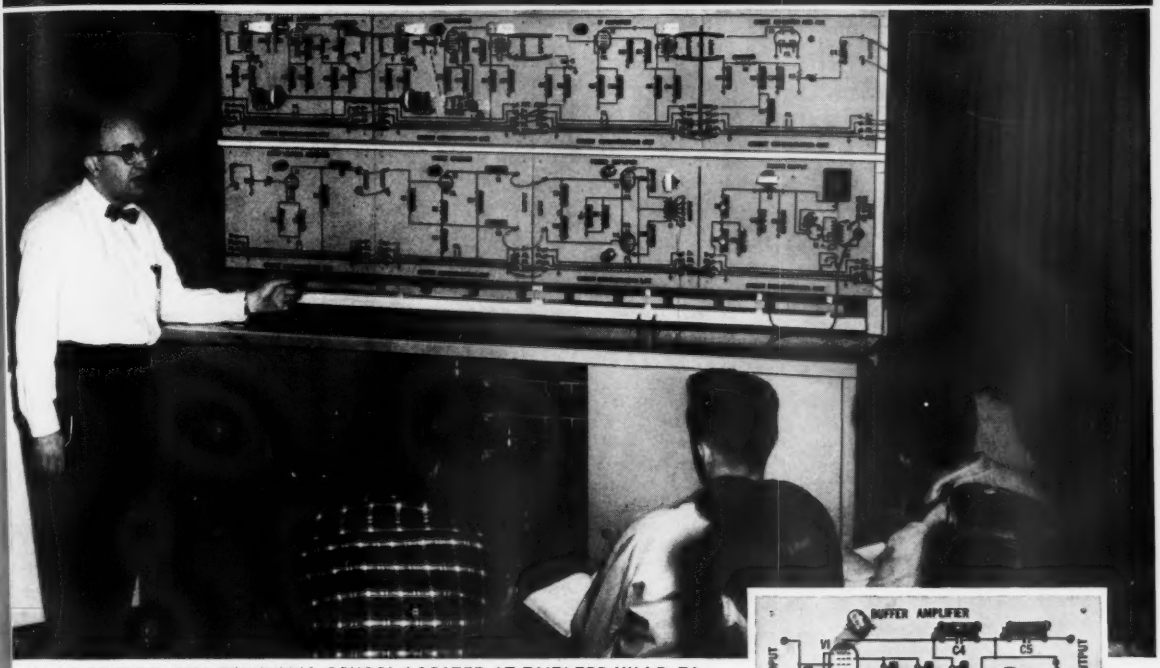

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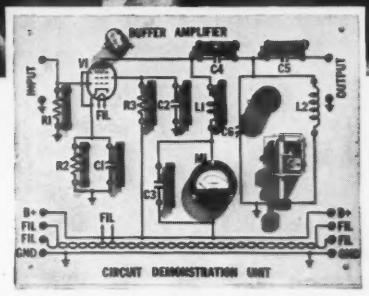

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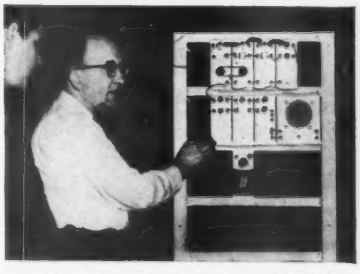

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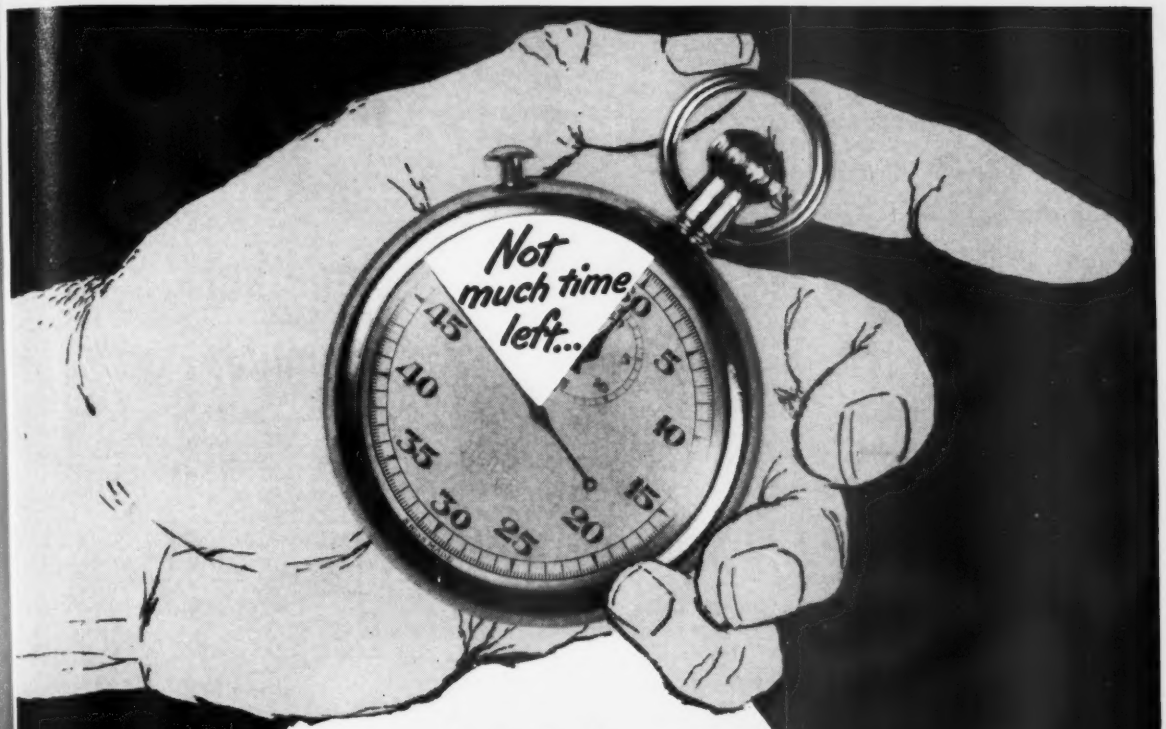

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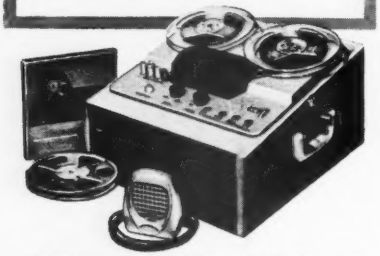

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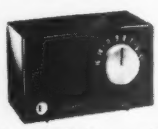

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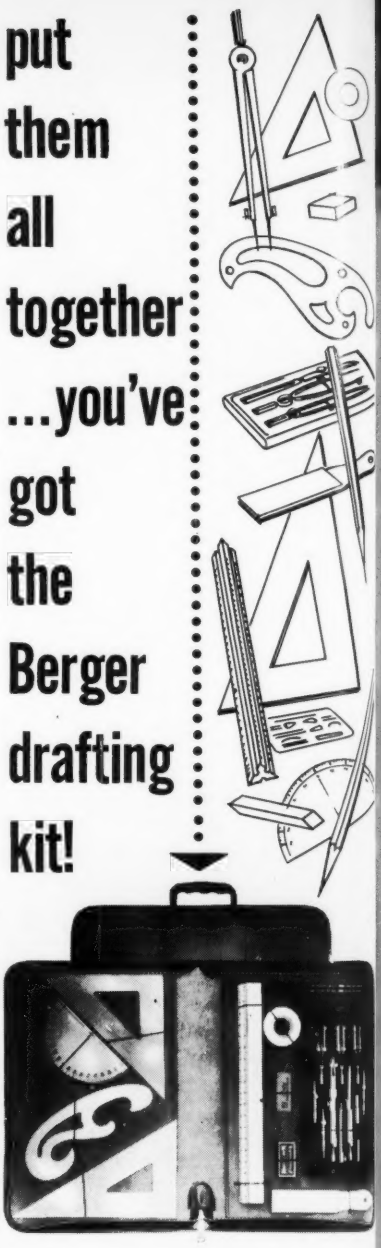

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William W. Miles, Sandy Spring, Md., AVA Assistant Executive Secretary Lowell A. Burkett and Samuel M. Burt, Executive Sec'y, International Graphic Arts Education Ass'n pose at the IGEA exhibit shown at the 1960 Convention of the NASSP, Portland

HOW ISA WILL DEFINE THE INSTRUMENTATION TECHNICIAN

(from page 20)

I, personally, cannot speak for the instrument field as well as I can for the radio, television, and electronics field. But, in *that field*, it has been my experience that a vast majority of technicians in the radio, television, electronics field has become trained for this work through something a little more practical than pre-engineering college subjects. These men *have not* studied calculus, they *are not* well-grounded in the fundamental sciences, and they probably wouldn't be sufficiently interested in an engineering college curriculum to complete it—not even an "abbreviated" one. Yet, you can give such men a practical trouble-shooting problem on electronic equipment — any kind of electronic equipment — and they can successfully trouble-shoot it, probably better than an engineer could. There are very few instances (if any) in which a technician in this field may be called upon to employ differential equations. Thus, the man who can work differential equations is a rare bird, and his job can probably be more accurately described as that of a junior engineer.

It has been suggested that the results of our survey must be analyzed very carefully, since they represent opinions of the people being surveyed. This is misleading. It sounds as though we are dealing with guesswork, and that simply is not true. We are dealing with facts, as far as they are known by the people who are filling out our questionnaires. Let me clarify that. We are not asking for opinions as to what training a man should have, we are asking for the facts as to what a certain group of technical people do, as far as these facts are known by the person filling out the questionnaire form.

Previous surveys on the question of technician training have dealt with the opinions of the people being surveyed; they have called for opinions as to what training or skill is required to qualify a man to be a certain type of technician. For the most part, such surveys have been of little help *because they have called for judgments and conclusions*, rather than facts. Moreover, those earlier surveys were unsuccessful because the subject of the survey, the technician, had never been defined.

In preparing the questionnaire form which our Task Force is using we have avoided asking questions pertaining to technicians or mechanics, as such. We have asked our questions in relation to what we call the "subject-group." This subject-group is defined on Page 1 of the questionnaire in unmistakable language.

NOW, WHAT IS the present status of our survey? Our goal is to survey from 200 to 500 representative industrial plants within the United States. We have now received about 125 completed questionnaires. Many more are needed in order to assure that the information that is gathered through this survey comes from a sufficiently large segment of industry to be representative of the whole.

In order to achieve this goal, we earnestly solicit all the help we can get from everyone who is interested in the success of our project. I am sure that all educators appreciate what the program of this Task Force means and the benefits which they can derive from it. I urge you very strongly, therefore, to join with us in helping to get our questionnaires distributed throughout industry and filled out by the appropriate people. Generally the questionnaires should be directed to one person in the plant who is responsible for the plant's instrumentation. It also should be channeled through the personnel office or at least be brought to the attention of that office. The target date for the completion of the whole project is September, 1960, when a final report will be issued to the I.S.A. Annual Convention in New York. Obviously, the survey must be completed well in advance of that date, in order that the results can be tabulated and a report compiled. We've set April 15, 1960, as the deadline for getting the last of our questionnaires out into industry's hands.

Today our country faces many challenges, not the least of which is the threat of Soviet aggression. But, whether the dangers of the future lie in our possible military incompetence or in economic upheaval that could be brought about by the spread of automation, it should be recognized that technical education must be expanded far beyond anything we can conceive today.

THE DAY WHEN technical education curricula can safely be drawn up on the basis of opinions, prejudices, and guesswork is past. The requirements of the job are becoming so exacting that every hour devoted to the training program is too precious to be wasted on subjects of lesser importance. In order to draw up the curriculum through which to train a man for a certain job, that job must be measured scientifically. Moreover, the job title must not be vague and meaningless. It must be defined in terms which anyone can understand and accept.

These are the objectives of the Task Force on Instrumentation Technicians. We invite your help and support in making our program more meaningful and beneficial to you.

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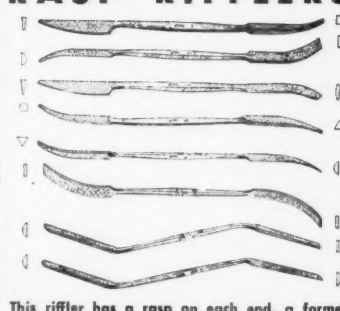

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Kansas: Leo Fleck, Winfield, President; Sue Ann Sipes, Dodge City, President Elect; Julian A. Johnson, Buhler, Executive Secretary; Marvin E. Smith, North Topeka, Treasurer; Vice Presidents: Lester Crandall, Ellsworth, Agriculture; Patricia Dwerlkotte, Concordia, Homemaking; Verner F. Williams, Great Bend, Business; Gilbert Butts, Wichita, Industrial Education.

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First Thai to Receive Doctorate in Industral Education

Thanoo Swaengsugdi of Thailand was the first Thai to receive a doctor's degree in industrial education at Wayne State University, Detroit, Michigan (Feb. 1960). He has studied in the U. S. since 1955, receiving the BS and MA degrees from Wayne State University. He was the first person to be cited for top honors for graduate study in 1958 by the Ambassador from Thailand.

His dissertation is *A Study of the Educational Programs of Thai Students in the United States under the Sponsorship of the International Cooperation Administration during 1958-59.* His study provides data for the projection of an improved educational program for Thai students in the U. S. He has recently been assigned by his government to the South East Asian Treaty Organization's Technical Training Center with responsibility for teacher education.

In the U. S. Dr. Swaengsugdi was active in social activities and in honorary professional fraternities and arranged exhibits of Thai cultural materials. He joined the AVA, AIAA, and the American Council for Industrial Arts Teacher Education.

James Horan, Jr. DECA Board Chairman

James Horan, Jr., was elected chairman of the Board of Trustees of the Distributive Education Clubs of America at a Board meeting held during the recent AVA Convention. Mr. Horan is Virginia assistant state supervisor of Distributive Education and State Club Sponsor. By virtue of his office as chairman of the Board of Trustees, Mr. Horan will also serve as president of DECA, Incorporated, as well as a member of the Policy and Planning Committee of the AVA.

The Board of Trustees is responsible for all policies governing DECA and for the operation of DECA National Headquarters. This year, the major emphasis will be on the development of a Program of Work for the $10,000 Foundation budget recently approved by the Board of Trustees. The Board is composed of ten members, representing all regions of the country.

HEBER A. SOTZIN

Dr. Heber A. Sotzin, who headed the industrial arts department at San Jose State College at San Jose, Calif., since 1929, died on January 6, 1960.

Dr. Sotzin was born September 22, 1893 at Pine Grove, Pa. He received the B.A. degree from George Washington University, Washington, D. C., in 1923, and the M.A. in 1926 from the same school. In 1929 he received the Ph.D. from the University of Cincinnati.

In his years of teaching from 1915 to 1927, Dr. Sotzin served in the public schools of Indiana, Pennsylvania, and Washington, D. C.

In addition to heading the industrial arts department at San Jose State College since 1929, he taught in summer sessions at the University of Cincinnati, Stanford, University of Utah, Ohio State University, University of Hawaii, Bradley University, and SJSC.

Dr. Sotzin founded Rho Chapter of Epsilon Pi Tau at SJSC in 1938. In 1957 he was elected chairman of the board of trustees of Epsilon Pi Tau.

He was a member of Phi Delta Kappa, American Vocational Association, American Industrial Arts Association, American Council of Industrial Educational Associations, and the Association of University Professors and was listed in *Who's Who in America.*

In 1957 he was cited by the California Industrial Education Association for outstanding service to industrial education.

MARTHA CREIGHTON

Martha Creighton, Professor of Home Economics Education at VPI until her retirement last October, died on February 19 in a Roanoke Hospital. Following a funeral service in Blacksburg, interment was in Rock Hill, S. C. She is survived by a sister, Mrs. Robert C. Blackmon of Lancaster, S. C. and two brothers, Robert K. Creighton of Wilmington, N. C. and Julian P. Creighton of Charlotte, N. C.

A native of South Carolina, Miss Creighton spent her girlhood in Rock Hill and attended the public schools there. She later received a degree at Winthrop College and after teaching home economics several years entered the Extension Service in her native state. She was the first home demonstration agent in Lancaster County, South Carolina. Following a period of service as District Home Demonstration Agent for Western North Carolina, Miss Creighton enrolled for further study at Teachers' College, Columbia University, receiving both the bachelor's and master's degree there. Later she did advanced graduate work at Iowa State College.

As Assistant State Supervisor and as State Supervisor of Home Economics Education in Virginia, Miss Creighton played a major role in the early development of the State's program of Homemaking Education in the public high schools. As an evidence of her many contributions to the program of vocational education in general and homemaking education in particular, Miss Creighton was presented the Outstanding Service Award of the American Vocational Association. She also served as the first president of the Association from Virginia. She is listed in *Who's Who in America* and *Who's Who of American Women.* As an evidence of their esteem, teachers of Homemaking in Virginia have provided a scholarship in her honor.

Dr. G. Harold Silvius is shown approving the dissertation submitted by Dr. Thanoo Swaengsugdi at Wayne State University

Launch a Career was the theme of the student-made float that won first place in St. Paul's competition

BRIEF NEWS

St. Paul Student-Made Float Places First in Competition

More than a little ingenuity and hard work was displayed by St. Paul Area Vocational school students when they set out to build a float to represent their school in the city's Winter Carnival parade — part of a week-long extravaganza held annually in January.

Viewed by over 200,000 people along the parade route, the dazzling gold creation won Junior Royalty's first prize award—"not only on the basis of excellence alone, but because it reflects pride in workmanship, co-operation and a feeling of carnival spirit and fun."

Involving technical know-how of students and instructors from many departments, the float evolved from a student design contest, a student committee that revised ideas from the best three entries and a drafting student's working drawings. At this point, the already skilled hands of future craftsmen working in ten different shops fabricated and assembled the display-on-wheels that for several weeks had been the subject of school-wide interest.

Financed jointly by St. Paulites Inc. and the school's PTA, it was built at a cost of $100. The PTA, in addition, made available an 8 x 16-foot trailer and, to pull it, the local National Guard unit furnished a jeep and driver.

The gold float trimmed with purple and white featured a rocket pointed skyward and the theme "Launch a Career." Tagging along behind it was a five-foot snow man bearing a sign "Vocational Bound." Its function — to conceal a power plant that furnished electrical current for flashing lights and other devices.

The float, also displayed at a pre-carnival PTA meeting, was a drawing card for what Principal Allyn C. Taylor termed "our best attended meeting of the year."

St. Petersburg Observes Adult Education Day

The Pinellas County Schools, Department of Adult and Vocational Education, through the courtesy of Maas Brothers Department Store in St. Petersburg, Florida, has developed a program of live one-hour classes in the store's windows. Regular instructors and adult students were used, and the following are some of the subjects scheduled: electronics, typing, citizenship, slip covering, cosmetology and floral arrangement. Fifteen minute breaks were used to reset the window area for the following class.

As an example, ten typewriters, tables and chairs were set up; Mrs. Margaret Hudson, instructor, used a warm-up, rhythm-building exercise with the use of Gregg records and the transcription of a business letter for her hour lesson. Later, foreign-born students from the evening citizenship class came for instruction on the *Rights of Citizens.*

Information was made available to the public on all classes and programs. The store displayed posters giving the time and subjects, and the local newspapers gave publicity. Although this was used as a part of American Education Week, it could be developed at any time during the school year as a way of promoting good relations between local business people and educators.

Agriculture Teacher Educators Organize

A new organization known as the American Association of Teacher Educators in Agriculture was formed at the American Vocational Association convention in Chicago in December.

Membership of the organization is composed largely of teachers of professional education courses in colleges and universities preparing high school teachers of vocational agriculture. There are now 67 such institutions.

Purposes of the American Association of Teacher Educators in Agriculture are: to provide greater opportunity for exchange of ideas, philosophy, and professional materials among members of the profession; to improve communication with professors of agriculture; to work more closely with other teacher education groups toward the improvement of teacher education standards, and to encourage educational research.

Kentucky Operates Vocational School of the Air

The Somerset Area Vocational School, Somerset, Kentucky, in cooperation with Radio Station WSFC, recently concluded *The Vocational School of the Air* with a 13 week course in business law for everyday use. Along with the studio class the listening audience participated in class instruction and discussion by phone. Participants paid one dollar enrollment or four dollars for registration fee and text. The textbook *Business Law for Everybody*, a valuable reference, was available at $3.00 per copy. The class was taught by Meriel D. Harris, prominent Somerset attorney. At the close of the course certificates of achievement were awarded to registrants.

It is believed that this is the first time such a class has been broadcast, and the plan created a great deal of interest in the community as well as good publicity for the Somerset Area Vocational School.

TED WILLIAMS

Ted Williams, age 55, died at the South Highlands Infirmary in Birmingham, Alabama, after a short period of heart illness. He was born in Arkadelphia, Alabama, and lived in Birmingham at the time of his death.

In 1950 he was employed by the State Department of Vocational Trade and Industrial Education as State Instructor in Workers Education. A life member of AVA, he will be long remembered for the excellent job he did in Alabama in training the members of labor organizations in workers education.

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Alvin's new booklet, *Tips-Techniques and Drafting Aids* is a must for every instructor, student, engineer, architect, artist or draftsman. Contains 32 pages of illustrated, helpful hints.

From the U. S. Office

Mary Lee Hurt, Specialist in Curriculum Studies, Home Economics Education Branch, served as one of the consultants at a workshop for Arlington (Virginia) County homemaking teachers on January 27. Teachers were working on how to adapt curriculum to meet needs of pupils in these rapidly changing times.

* * *

A special committee of four State Supervisors of Agricultural Education, consisting of Warren G. Weiler, Ohio; H. E. Edwards, West Virginia; A. G. Bullard, North Carolina, and L. C. Dalton, New Mexico, met with the staff of the Agricultural Education Branch in Washington, D. C., February 8-10, to develop a program for a workshop for State Supervisors to be held in Washington during the summer of 1960.

* * *

Margaret Alexander, Program Specialist, and Mary Lee Hurt, Specialist in Curriculum Studies, Home Economics Education Branch, participated in meetings of the American Association of School Administrators, the American Educational Research Association, and the Department of Home Economics held in Atlantic City in February. Miss Hurt is currently President of the Department of Home Economics.

* * *

R. Edward Naugher, Program Specialist, and Malcolm C. Gaar, Specialist, Teacher Training and Service Studies, Agricultural Education Branch, spent February 4 and 5 at Virginia Polytechnic Institute in Blacksburg in conference with members of the teacher training and State supervisory staff in discussing plans for making a study of the occupational opportunities for young men in the dairy industry. If the need exists, a pilot center is to be established to provide training of less than college grade for these young men. Guiding principles to be used in making the study and setting up a program of instruction were discussed. On February 6, they participated in the 10th Annual Young Farmer Conference in Roanoke. Approximately 400 young farmers and young homemakers were in attendance. Representatives of the Pennsylvania and South Carolina Young Farmers State Associations also participated in this Conference.

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For the benefit of Program Specialists who have joined the staff of the Division of Vocational Education recently, Ward P. Beard, Assistant Director for State Plans and Grants, recently conducted a series of meetings which were in the nature of training sessions on the significance and use of Vocational Education Bulletin No. 1, *Administration of Vocational Education*, and ways to provide professional assistance to the States in the preparation and review of State plans for vocational education. Members of the staff expressed a desire for the opportunity to discuss these matters and to gain an improved understanding of ways in which the staff of this Division can provide better service to the States.

H. N. Hunsicker, Program Specialist, Agricultural Education Branch, participated on February 9 in a meeting at the University of Massachusetts where the possibilities were explored for consolidating agricultural teacher training in the New England States. In the area, States have a relatively small number of teachers of vocational agriculture, with the result there has been limitation on the size of teacher training staffs at the institutions. Participation in the meeting included State Directors of Vocational Education, supervisors and teacher trainers in agricultural education, and representatives of the colleges of agriculture, including persons from Massachusetts, Vermont, Connecticut, Rhode Island, and New Hampshire.

* * *

Instructional Materials Development and Use was the title of an address given by Merle Strong, Specialist, Teacher Training and Service Studies, on March 10 at the Interregional Conference on Trade and Industrial Education in Bristol, Virginia. The Conference, which was attended by representatives from North Carolina, South Carolina, Tennessee, and Virginia, was coordinated by Edward G. Ludtke, Program Specialist for the Southern Region.

* * *

Mississippi State College for Women at Columbus held a symposium on education for women Feb. 2 and 3. This was the second major event of the 75th anniversary celebration of this institution, the oldest State college for women in the nation. Edna P. Amidon, Director of the Home Economics Education Branch, was one of four speakers on February 3. Her topic was *Educating Wives and Mothers for Successful Family Living in a Changing World*. Other topics discussed were *What to Look for in a Career, Exploding the Myth of the Marriage-Career Conflict,* and *Educating Women for the Future.*

* * *

The annual meeting of the Future Farmers of America Foundation Board of Trustees was held in the office of the Director of the Agricultural Education Branch of the Office of Education, January 25-27. The annual financial report was made by R. E. Bass, State Director of Vocational Education in Virginia, and National Treasurer of the FFA and the FFA Foundation. After all expenditures for 1959 had been made there remained a sufficient balance to add to the reserve fund and to meet requirements for the 1960 budget. On Wednesday, January 27, a joint meeting of the Foundation Board of Trustees and approximately 100 donor representatives was held in the auditorium of the U. S. Department of Health, Education, and Welfare.

* * *

A four-day institute for the training of industrial conference leaders, conducted by Earl M. Bowler, Assistant Director, Trade and Industrial Education Branch, was held at Hancock, Maryland, March 14 to 17. This institute resulted from a series of discussions of needed activities in a four-State area of the North Atlantic Region. From the States of Virginia, West Virginia, Maryland, and Pennsylvania came 16 trade and industrial educators who were concerned with a specific problem. They have returned to their States with an improved understanding of the techniques involved in industrial conference leading. It is anticipated they will engage in these activities in their home States and be prepared to train others to expand opportunities for industrial personnel to lead conferences.

* * *

Information of general interest in area vocational education is contained in the first of a series of one-page bulletins, C.L. 3460-1, released by the Division of Vocational Education on February 1. Planned to be issued from time to time, C.L. 3460 will feature developments in the States of educational programs under Title VIII of the National Defense Education Act of 1958, useful information for the establishment and improvement of these programs, and a variety of items related to technological developments and manpower problems. Copies may be obtained by writing to the Area Vocational Education Branch, Division of Vocational Education.

* * *

William N. Elam, Program Specialist, Agricultural Education Branch, reached the mandatory retirement age on January 31 after 23½ years of continuous service in the Division of Vocational Education. Mr. Elam received the Bachelor of Science Degree from Texas A & M College and the Master of Science Degree from the Colorado Agricultural College at Fort Collins. He completed additional graduate study at the University of Texas. Prior to accepting the invitation to join the staff of the Office of Education, Mr. Elam taught for four years in the rural schools of Texas and completed 20 years as teacher and district supervisor of vocational agriculture in that State. He was twice honored as the Master Teacher of Vocational Agriculture in Texas. Mr. and Mrs. Elam will continue to live at their present home in Washington, D. C.

* * *

Donovan R. Armstrong, Program Specialist, Distributive Education Branch, conducted the Southern Regional Conference in Birmingham, Alabama, February 8-12. Conference discussions were devoted to *How to Meet Tomorrow's Challenges in Supervision* and *Program Development in the 60's*. John A. Beaumont, Director of the Distributive Education Branch, served as leader of a shadow panel at the Conference. The panel's topic was *They Said It Couldn't Be Done (But—Did It)*. Mr. Beaumont also addressed the Conference on *The Post High School Program and Title VIII.*

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from the Public Information Committee

North Carolina Moves Toward a State Public Information Committee. The Public Relations Committee of the North Carolina Vocational Association has recommended that a state committee on public information be established. The Committee urges further that teachers be encouraged "to continue to contribute to newspapers interesting materials on vocational education" and "to continue to cooperate with radio and TV stations by providing programs interesting to the profession."

New York City Publicizes High Schools' Role in Meeting Manpower Needs. The Board of Education of the City of New York has released a very attractive 43-page publication with many illustrations entitled *The Role of the High Schools in Meeting the Manpower Needs of New York City.* The publication reports what is being done by the high schools to supply manpower for aviation, the automotive trades, electronics, printing, the fashion industry, beauty culture, nursing, the maritime trades, the performing arts, and many other areas.

New York Association Emphasizes School and Community Relations. *Viewpoint*, the magazine of the New York State Vocational and Practical Arts Association, has devoted its January 1960 issue to school and community relations. Articles with the following titles were included: *School and Community Relations in the Agriculture Department, Summer Homemaking Education Programs Improve School-Community Relations, The Uninformed are Apathetic—The Partially Informed are Dangerous, Public Relations in Adult Industrial Education.*

Writing for the Teaching Profession. One of the objectives of the Committee on Public Information is to encourage AVA members to write for the publications read by members of the teaching profession outside their own special fields. Miss Ruth Wheeler of Evanston Township High School, Evanston, Illinois, has contributed an article on *Home Economics for College-Bound Girls*, published in the March 1960 NEA JOURNAL which could have an important influence upon persons in the schools who counsel girls out of home economics when it is learned that they will attend college. We need many more contributions by teachers and administrators in vocational and practical arts education in many more of the national and state educational periodicals.

School Shop Examines Public Information and Relations. *School Shop*, one of the oldest periodicals in our field, will give attention in its April issue to public information and public relations for vocational and practical arts education. The entire issue will deal with this subject. It will include a report of an interview with the Chairman of the AVA Committee on Public Relations and some pointed comments by Ben Brodinsky on the application of Madison Avenue techniques to our field.

Engine Bearing Service Manual. Federal-Mogul Service, Division of Federal-Mogul-Bower Bearings, Inc., Detroit 13, Michigan, 1960.

Designed strictly for the instruction of those who work with automotive engines and engine bearings, this handsome manual will prove useful to vocational school instructors. It contains information on automotive engine bearing design, procedure for replacing bearings, special points to watch during engine overhaul, and common engine troubles and causes.

One thousand copies of the manual are available free of charge. If interested, send in your order to AVA office, 1010 Vermont Avenue, Washington, D. C., and the first thousand will be filled.

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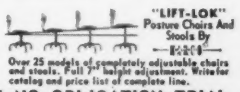

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